Engineering Design Report

American Plating Site Remediation Project
Tacoma, Washington

for
Washington State Department of Ecology
on Behalf of
Foss Waterway Development Authority

January 27, 2012

GeoEngineers
Earth Science + Technology

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1.0 INTRODUCTION

This Engineering Design Report (EDR) has been prepared for the planned remedial action at the American Plating Site (Site) located at 2110 East D Street in Tacoma, Washington. The American Plating Site occupies approximately 1.4 acres of land that is located along the eastern shoreline at the head of the Thea Foss Waterway (Figure 1). The remedial action is being conducted by the Foss Waterway Development Authority (FWDA) to satisfy requirements of a Prospective Purchaser Consent Decree (CD) (No. 03 2 14513 6) issued by the Washington State Department of Ecology (Ecology) to address contamination resulting from releases from past metal plating operations at the Site. The American Plating Facility/Site Identification Number (ID) is 1202 and Cleanup Site ID is 2539.

This EDR was prepared to meet the requirements of the Washington State Model Toxics Control Act (MTCA), Chapter 173-340, of the Washington Administrative Code (WAC). The remedial action is being conducted to implement the preferred cleanup alternative specified in the Ecology-approved Cleanup Action Plan (CAP) (GeoEngineers, 2003) prepared for the Site. The preferred remedial alternative includes excavation and capping of soil with contaminant concentrations greater than the Site cleanup levels. The remedial action is anticipated to occur over a period of 30 to 60 days beginning in March 2012.

The primary objective of this EDR is to present the plans and procedures for remediation of the Site. The major elements discussed in this EDR include:

- Site background
- Nature and extent of contamination
- Completed remedial actions
- Cleanup requirements
- General description of cleanup action
- Permits
- Site preparation
- Soil excavation and disposal
- Grading and capping
- Site restoration
- Quality assurance/quality control (QA/QC)
- Health and safety
- Schedule and reporting

A Compliance Monitoring Plan (CMP) describing the performance and confirmational monitoring to be performed to verify the effectiveness of the cleanup action is included as an attachment to this document (Attachment 4).

1.1. Instructions to the Contractor

The beginning sections of this EDR (i.e., Sections 1.0 through 6.0) summarize the Site background, nature and extent of contamination, and remedial actions previously performed and to be performed at the Site for the purposes of providing the background and basis for the work to be performed as part of the American Plating Site Remediation Project. The remaining sections of this EDR (i.e., Sections 7.0 through 24) present the project specifications and plans that identify the contract requirements for performing remedial actions as part of the American Plating Site Remediation Project. The Contractor shall base their bid submittal on the project specifications, plans, contract documents as well as background information, as appropriate, that have been prepared by the Engineer.

2.0 SITE BACKGROUND

2.1. Historical Operation and Site Use

The Site has primarily been used for light industrial activities. Puget Sound Plating and Seymour Electroplating occupied the Site between 1955 and 1976. Lewis R. Jones owned the property from 1962 to 2003. During that time, American Plating occupied the Site from 1976 to 1986. All three firms performed metal plating operations. Former structures at the Site included several buildings that housed metal plating operations as well as concrete sumps, drainage features, piping and a tank that supported operations in the buildings (Figure 2).

Building 1 housed multiple plating operations including zinc, cadmium and nickel plating operations which were located in the southeastern portion of Building 1 and brass, chromium, copper and nickel plating operations which occupied the western portion of Building 1. The plating operations in the western portion of Building 1 were performed over a 25,000-gallon concrete-lined sump. A 1,000-gallon tank used for degreasing was located in the south-central part of Building 1. Items were degreased in the tank using chlorinated organic solvents prior to plating. Building 1 was also identified to be used for painting operations, chemical storage, product testing, and office space.

Building 2 reportedly housed zinc plating operations and was also used to store drums of chemicals and wastes. A sump was present on the western portion of Building 2 that was used to capture wastes from plating operations.

A third building was identified to be located south of Building 1 and east of Building 2 in the location of a concrete pad. The use of the third building was not identified.

A 658-gallon underground storage tank (UST) was located east of Building 1 adjacent to East D Street. The UST was reported to have been used for gasoline storage in the late 1960s. Investigation performed in 1988 indicated that the UST contained water and residual petroleum product that appeared to be comprised of fuels such as gasoline, diesel or light fuel oil.

During metal plating operations, spent plating and washdown solutions from both buildings (i.e., Building 1 and Building 2) were directed to the 25,000-gallon sump located in Building 1. Wastes from the plating operations in the western part of Building 1 went directly into the underlying sump

through a grate in the floor. Wastes from operations performed in the southeast part of Building 2 were directed via drains and a trench cut into the concrete floor of Building 2 to a small sump immediately west of Building 2. From there the wastes were pumped to the large sump in Building 1 (GeoEngineers, 2003).

Building 1, Building 2, the concrete pad in the former location of Building 3, the sumps, and the UST were previously removed from the Site as described in Section 3.1.

2.2. Current and Future Land Use

The American Plating Site is zoned S-8 Shoreline District, Thea Foss Waterway. Permitted uses under S-8 zoning include existing commercial and industrial activities, water-oriented recreation, marinas and boat launch facilities, environmental remediation, roads and utilities as well as other uses. Site planning has identified the development of a public park and public access on the two parcels located along the eastern shoreline at the Head of the Thea Foss Waterway including the parcel comprising the American Plating Site.

Currently, a portion of the Site is being used by Berg Scaffolding for storage of scaffolding and equipment (i.e., hydraulic lifts) and vehicle parking (Figure 2). Additionally, a road transverses the central portion of the Site that provides access to the Berg Scaffolding office building as well as Berg Scaffolding's main storage yard located on the parcel south and adjacent to the Site.

A riparian habitat enhancement area is present along the shoreline of the Site. The riparian habitat enhancement was constructed along the shoreline adjacent to the Site and the parcel to the south in 2004 as part of the Thea Foss Waterway Remediation Project. Contaminated sediment in the Thea Foss Waterway at and below the Ordinary High Water (OHW) line adjacent to the Site and adjacent to the parcels north and south of the Site, were capped as part of the Thea Foss Waterway Remediation Project. The habitat enhancement consists of a log step bench that was constructed on top of a slope cap built to contain contaminated sediment. The plans for the habitat enhancement area specified that plants including saltgrass (*Distichlis spicata*), fleshy jaumea (*Jaumea carnosa*), tufted hair grass (*Deschampsia cespitosa*), and hooker's willow (*Salix hookeriana*) be installed in an area between 5 and 8 feet wide behind and upland of the log that was anchored along the shoreline. The original construction plans for the habitat enhancement area are presented in Attachment 1.

Future use of the Site, and the adjacent parcel to the south, is as a public park and to provide public access along the waterfront through expansion of the Foss Waterway Esplanade corridor. Additionally, Site use includes facilities for non-motorized boats as well as access to the Thea Foss Waterway. Remediation of the Site is required prior to development of the Site for use as a park and for public access and non-motorized boats to reduce the potential threat to human health and the environment.

2.3. Previous Site Investigations

Multiple environmental investigations have been conducted at the Site. In 1988, 1989, and 1994, a Phase I Environmental Site Assessment, Phase II Site Investigation and a Supplemental Groundwater Investigation were performed at the Site. These investigations included characterization of soil and groundwater and included installation of 12 monitoring wells.

Additional groundwater sampling was performed at the Site in January 1995. In 2003, an Interim Action Cleanup was performed that included collection and analysis of soil samples. The Interim Action Cleanup addressed some, but not all, of the contamination identified on the Site (GeoEngineers, 2003). Remedial activities performed as part of the Interim Action Cleanup are summarized in Section 3.1. Additionally, starting in February 2004 and continuing through October 2011, semi-annual groundwater monitoring has been performed at the Site.

2.4. Geology and Hydrogeology

This section summarizes the geology and hydrogeology of the Site based on the results of previous Site investigations as described in the CAP (GeoEngineers, 2003).

2.4.1. Soil

The Site is built on fill material of variable thickness placed in the early 1900s, coincident with the development of the Waterway. The fill material overlies unconsolidated silt, which ranges from 0 to over 15 feet thick. Beneath the silt is a deposit of sand, gravel and silt that ranges from 5 to over 10 feet thick. The deepest unit encountered is a dense to very dense silty sand to silty gravel of unknown thickness that was encountered approximately 25 to 30 feet below ground surface (bgs). This deepest unit has been interpreted as glacial till. Additional detail, including geologic cross-sections, well logs, and water table contours are presented in the *Phase II Soil and Groundwater Investigation, American Plating Co. Facility* (Applied Geotechnology, Inc. [AGI 1989]).

2.4.2. Groundwater

Groundwater at the Site occurs primarily in the upper fill unit (the "fill aquifer") and in the sand, gravel and silt unit (the "sand aquifer"). Depth to groundwater at the Site is approximately 5 to 9 feet bgs. Groundwater flow is interpreted to be in a northwesterly direction towards the Thea Foss Waterway. Groundwater flow velocities have been estimated to be 17 feet per year in the fill unit and 41 feet per year in the sand and gravel unit.

Groundwater at the Site discharges to marine water in the adjacent Thea Foss Waterway. The fill aquifer is influenced by adjacent marine waters, as evidenced by tidally influenced water levels in the on-site monitoring wells and by saline groundwater as evidenced by percent range chloride concentrations in groundwater (GeoEngineers, 2003).

2.5. Site Cleanup Levels

Soil and groundwater cleanup levels for contaminants of concern (COC) were developed for the Site. The Site COCs were identified as part of interim action planning and implementation and groundwater monitoring performed at the Site by Ecology. The cleanup levels are intended to achieve the following objectives.

- Reduce human health risk by limiting the potential for direct contact with contaminated soil.
- Reduce potential risk to aquatic organisms in the Thea Foss Waterway caused by potential exposure to groundwater discharging from the Site to surface water.
- Allow for development of the Site as a public park and for public access.

Site-specific cleanup levels for COCs in soil and groundwater are discussed in the following sections. Information regarding the identification of cleanup levels is provided in the CAP (GeoEngineers, 2003) and in the semi-annual groundwater monitoring reports prepared by Ecology (Ecology, 2010).

2.5.1. Soil

The following COCs for Site soil were identified during interim action planning and implementation as described in the CAP (GeoEngineers, 2003):

- Cadmium
- Chromium VI
- Copper
- Lead
- Nickel
- Cyanide
- Vinyl chloride

MTCA soil cleanup levels for unrestricted land use were selected for the final cleanup action and were derived from Cleanup Levels and Risk Calculations (CLARC) under the MTCA Cleanup Regulation (Chapter 173-340 WAC, https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx). Soil cleanup levels for the Site COCs for use of the Site as a public park and for public access are presented in Table 1.

2.5.2. Groundwater

The following COCs for Site groundwater were identified during interim action planning as described in the CAP (GeoEngineers, 2003) as well as semi-annual groundwater monitoring performed by Ecology (Ecology, 2010):

- Cadmium
- Chromium
- Chromium VI
- Copper
- Nickel
- Cyanide

Groundwater cleanup levels were developed based on protection of marine surface water and the groundwater-to-surface water pathway. The groundwater cleanup levels are from the Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC). Groundwater cleanup levels for the Site COCs are presented in Table 2.

2.6. Nature and Extent of Contamination

2.6.1. Soil

Soil present at the Site contains metals including cadmium, nickel, and chromium at concentrations greater than the MTCA Method B cleanup levels for unrestricted land use (Chapter 173-340 WAC). Lead is also present in soil at the Site at concentrations greater than the MTCA Method A cleanup level for unrestricted land use. The existing analytical results indicate that soil with metals concentrations greater than cleanup levels for unrestricted land use are present across the Site from the surface to depths up to 9 feet bgs. Additionally, analytical results indicate that vinyl chloride is present in soil in the northeast portion of the Site at concentrations greater than the Method B cleanup level at depths up to 6.5 feet bgs. Finally, soil has been identified to contain metals at concentrations greater than the Toxicity Characteristic criteria (WAC 173-303-090) in two areas (GeoEngineers, 2003). Figures summarizing contaminant concentrations in soil, based on previous investigations, are presented in Attachment 2.

2.6.2. Groundwater

Semi-annual groundwater monitoring has been performed at the Site in monitoring wells MW-2, MW-3, MW-4 and MW-5 (Figure 2) starting in 2004. Metals including cadmium, chromium, hexavalent chromium, copper, and nickel as well as cyanide have been detected in groundwater at the Site during monitoring performed in 2004 through 2009. In groundwater samples collected between 2004 and 2009, hexavalent chromium, copper, nickel, and cyanide were detected in one or more samples at concentrations greater than the Site cleanup levels. During groundwater monitoring performed in 2010, cyanide was detected once at a concentration greater than the cleanup level. Cadmium, chromium, hexavalent chromium, copper, nickel, as well as cyanide were not detected at concentrations greater than the cleanup levels in any other groundwater samples collected from the Site in 2010 (Ecology, 2010). The results of groundwater monitoring performed at the Site are provided in Attachment 3.

3.0 COMPLETED REMEDIAL ACTIONS

3.1. Interim Actions Performed in 2003

Ecology performed interim actions at the Site in 2003. The interim actions included the following:

- Samples were collected for chemical analyses from an estimated 18,000 gallons of water contained in the 25,000-gallon concrete sump. Results indicated the water was acceptable for disposal in the City of Tacoma's municipal sanitary sewer system. The water was transferred to the sanitary sewer system after obtaining the necessary permits.
- A discrete layer of burn debris containing elevated concentrations of lead was found in soil beneath the concrete pad located on the southeast portion of the Site. The contaminant concentrations exceeded MTCA Industrial Standards but the soil did not designate as Dangerous Waste under Washington State Dangerous Waste Regulations (Chapter 173-303 WAC). The concrete was demolished and 3,418 tons of contaminated materials were disposed of at a Subtitle D landfill.

- Building 2, which had partly collapsed before interim remedial actions began, was demolished and disposed of at a Subtitle D landfill. Building 1 was found to contain asbestos. Due to its dilapidated condition, it was determined that the asbestos containing material (ACM) could not be safely separated from the structural components of the building. Building 1 was demolished and approximately 630 cubic yards of debris were packaged and disposed of as ACM. An additional 315 tons of concrete, building structural components and non-friable asbestos were also disposed of at a Subtitle D landfill. Building components contaminated with metals but that did not designate as Dangerous Waste under Chapter 173-303 WAC were also disposed of at a Subtitle D landfill.
- The 25,000-gallon sump located in the west side of former Building 1 was demolished and soil samples were collected for chemical analyses. Results indicated that concentrations of lead, chromium, and cadmium in the samples were greater than MTCA Method B cleanup levels. None of the samples contained metals concentrations that were greater than the Dangerous Waste Toxicity Characteristic criteria (Chapter 173-303 WAC) except for one surface sample collected at the southeast corner of the sump. The sample contained cadmium at a concentration greater than the Toxicity Characteristic criteria. Analysis of a composite sample of the concrete sump contained chromium at a concentration that designated the concrete as a Dangerous Waste. The concrete from this structure, approximately 288 cubic yards, was removed from the Site in 2004 and disposed at a Subtitle C landfill as part of Phase I remedial actions identified in the CAP. The Phase I remedial actions are described in Section 3.2.
- Based on historical knowledge of Site activities, previous sampling at the Site, and visual observations during demolition, soil samples were collected from eight areas at the Site as part of the interim actions. The samples were submitted for chemical analysis of metals and cyanide to evaluate if the soil exceeded MTCA Method B and Dangerous Waste Toxicity Characteristic criteria (Chapter 173-303 WAC). Test trenches were excavated in eight locations within the footprints of former Buildings 1 and 2. Composite samples were collected for chemical analyses from the sidewalls of the trenches. In five of the locations at Building 1, soil was found to have cadmium concentrations that were greater than the Toxicity Characteristic criteria. The elevated cadmium concentrations corresponded with visually observable staining in the soil. At one location, the concentration of chromium was greater than the Toxicity Characteristic criteria. The soil with cadmium and chromium concentrations greater than the Toxicity Characteristic criteria remain on site pending excavation and disposal that will be performed as part of the remediation activities specified in this EDR.
- A UST with an estimated capacity of 658 gallons, located in the northeast corner of the property, was emptied of approximately 160 gallons of water and residual petroleum product and removed under the supervision of a Washington State-Registered UST Site Assessor. Five confirmation soil samples were collected from the bottom and sidewalls of the excavation and one composite sample was collected from the stockpiled soil for chemical analysis. The analytical results indicated that soil containing concentrations of gasoline-range petroleum hydrocarbons, benzene, trichloroethene and vinyl chloride exceeding MTCA Method A cleanup levels remained in place near the former UST (GeoEngineers, 2003).

3.2. Phase I Remedial Actions Performed in 2004

The remedial actions specified in the CAP were identified to be performed in two phases. Phase I remedial actions were performed in 2004 to allow temporary use of the Site by Berg Scaffolding. Remedial actions performed as part of Phase I included the following:

- Placement of gravel in temporary use areas and as base course for construction of the access road. Gravel was placed as part of the D Street overpass project to provide a base course for asphalt paving and to provide temporary containment and capping in areas to be used for scaffolding and equipment storage on the Site.
- Installation of an asphalt access road across the Site. An asphalt road was constructed through the Site as part of the D Street overpass project to provide access to the Berg Scaffolding office building and main storage yard and to allow temporary use of the Site for storage of scaffolding and equipment.
- Removal and off-site disposal of concrete debris remaining from demolition of the 25,000-gallon sump in former Building 1. The material from the concrete sump was designated as Dangerous Waste based on chromium present in sampling and analysis performed in 2004. The concrete debris was transported off site in 2007 and disposed of at Chemical Waste Management in Arlington, Oregon (Ecology, 2011).
- Installation of fencing to limit Site access. Chain-link fencing was installed along the eastern boundary of the Site and connected to the existing chain-link fence present along the northern boundary of the Site. A gate was installed at the location where the access road enters the Site from the D Street Right-of-Way (ROW). The gate allows access to the Site, Berg Scaffolding office, and main scaffolding and equipment storage area during business hours and is secured during non-business hours to limit access and secure Berg Scaffolding equipment.

The remedial actions specified in the CAP that were not completed as part of Phase I are to be completed as part of the remedial action construction activities specified in this EDR. The remaining remedial actions to be performed as part of the construction activities specified in this EDR are summarized in the following section.

4.0 REMAINING REMEDIAL ACTIONS

The remaining remedial actions are to be completed to implement the preferred cleanup alternative specified in the CAP. The remaining remedial actions are for the purpose of redeveloping the Site for use as a public park, for public access, and for non-motorized boat facilities and include the following:

- Removal and off-site disposal of soil containing cadmium and chromium above Site cleanup levels from two areas.
- Construction of utility corridors for installation of stormwater collection, treatment, and conveyance systems and to provide remediated utility corridors to support future redevelopment of the Site.

- Isolation/containment (i.e., capping) of soil on the Site with chemical concentrations greater than MTCA unrestricted land use (i.e., Method B as well as Method A where Method B cleanup levels are not available) soil cleanup levels.
- Groundwater monitoring well replacement.
- Compliance monitoring.

Additional components of the preferred cleanup alternative specified in the CAP include implementation of institutional controls to control future excavations, long-term maintenance of the capped surfaces, and long-term groundwater confirmational monitoring. These additional components of the preferred cleanup alternative will be implemented after completion of the remaining remedial actions and are not part of the work specified in this EDR.

The following sections (i.e., Sections 4.1 through 4.5) provide an overview of the remaining remedial actions to be performed as part of this EDR to implement the preferred remedial alternative. Specifications for completing the remaining remedial actions are presented in Sections 5.0 through 24.

4.1. Remedial Excavation and Off-Site Disposal

Remedial excavation will be performed in two areas (Figure 3) at the Site to remove soil that was identified to contain metals at concentrations greater than the Toxicity Characteristic criteria (WAC 173-303-090) and material that may be a source of metals leaching to groundwater. The results of Toxicity Characteristic Leaching Procedure (TCLP) analyses on soil samples from borings performed at the Site identified the presence of chromium and cadmium at concentrations greater than the criteria (Attachment 2).

The initial limits of excavation at each area have been identified based on the results of previous investigation (Figure 3). Field screening (i.e., visual observations) will be performed by the Engineer at the initial limits of the excavation to evaluate whether additional excavation is needed to remove soil visibly contaminated with metals at concentrations greater than the Toxicity Characteristic criteria. When the limits of excavation have been reached based on visual field screening, verification samples will be collected from the sidewalls and base (i.e., bottom) of each excavation by the Engineer in accordance with the Compliance Monitoring Plan prepared for the American Plating Remediation Project (Attachment 4) and analyzed at a chemical analytical laboratory.

Where the verification sample results are less than the Toxicity Characteristic criteria, no further excavation will be performed. Where the verification sample results are greater than the criteria, additional excavation will be performed, as directed by the Engineer, to remove soil with concentrations greater than the criteria. Following any additional excavation, additional verification samples will be collected by the Engineer and analyzed to verify that the remaining soil meets the criteria. The excavations will be backfilled after verification sampling indicates that the contaminated soil removal has been completed.

The soil excavated from the two areas will be stockpiled separately for characterization in accordance with the Compliance Monitoring Plan (Attachment 4) prior to disposal. Samples of

stockpiled soil removed from the two soil excavation areas will be collected by the Engineer and analyzed at a chemical analytical laboratory. The results from stockpiled soil sampling and analysis will be compared to landfill disposal criteria by the Engineer to identify the appropriate disposal location. The Engineer will transmit the sample results to the landfill for authorization and acceptance of the stockpiled material for disposal. Upon receipt of authorization and acceptance for disposal, the contractor shall transport the stockpiled material to the landfill for disposal and provide the documentation of disposal to the Engineer. Sampling and analysis, comparison of the sample results to landfill criteria, and acceptance of the stockpiled material by the landfill will be performed/obtained prior to transport of the stockpiled soil to a landfill for disposal.

4.2. Utility Corridor Excavation and Off-Site Disposal

Excavation will be performed in three areas (Figure 3) at the Site to construct three utility corridors. Construction of the utility corridors will allow installation and maintenance of utilities to be used for Site redevelopment as a public park and for public access. The limits of each utility corridor excavation area have been identified based on the utility types and alignment of utilities to be installed. The excavations will remove the existing soil with contaminant concentrations greater than Site cleanup levels and replace the soil in the utility corridors with materials imported to the Site. The limits of the excavated utility corridors will be lined with geotextile material to demarcate the boundary between remaining Site soil and material used as backfill.

The soil excavated from the three areas will be stockpiled separately for characterization in accordance with the Compliance Monitoring Plan (Attachment 4) prior to disposal. Samples of stockpiled soil removed from the three soil excavation areas will be collected by the Engineer and analyzed at a chemical analytical laboratory. The results from stockpiled soil sampling and analysis will be compared to landfill disposal criteria by the Engineer to identify the appropriate disposal location. The Engineer will transmit the sample results to the landfill for authorization and acceptance of the stockpiled material for disposal. Upon receipt of authorization and acceptance for disposal, the contractor shall transport the stockpiled material to the landfill for disposal and provide the documentation of disposal to the Engineer. Sampling and analysis, comparison of the sample results to landfill criteria, and acceptance of the stockpiled material by the landfill will be performed/obtained prior to transport of the stockpiled soil to a landfill for disposal.

4.3. Isolation/Containment of Contaminated Soil

Capping will be performed to isolate/contain the remaining soil contaminated at concentrations greater than the Site cleanup levels. As stated above, soil present at the Site contains contaminant concentrations greater than the MTCA cleanup levels for unrestricted land use (GeoEngineers, 2003).

Capping will consist of the placement of clean soil fill or soil fill and asphalt over contaminated soil present across the Site. Three feet of clean soil fill will be placed in areas where the post-remediation surface is planned to be vegetated or gravel. Sixteen inches of soil base course and 3 inches of asphalt pavement will be placed where the final surface will be roadway, parking, or equipment storage. The existing access road, parking, and equipment storage areas will be reconstructed as a component of the remedial action and will be constructed in accordance with the requirements of the CAP (i.e., 3 feet of clean soil fill with a vegetated or gravel surface, 16 inches of base course and 3 inches of asphalt surface).

The Contractor will identify the source or sources (i.e., borrow pits, supplier facilities, etc.) that are proposed to provide soil fill and capping materials and shall also provide the results of grain-size distribution and modified Proctor tests performed on all proposed types of soil fill and capping material from the identified sources. The Engineer will perform an inspection of the proposed soil fill and capping material sources and will collect samples of the materials to chemically characterize the soil fill and capping material. Chemical analyses will be performed on the material to evaluate whether the material meets MTCA unrestricted land use criteria. MTCA unrestricted land use criteria are the Site cleanup levels specified in the CAP.

Chemical analysis of the soil fill and capping material and comparison of the analytical results to the MTCA unrestricted land use criteria will be performed by the Engineer prior to the Contractor importing the material to the Site. If the results for a specific soil fill or capping material sample indicate the presence of one or more chemicals at concentrations greater than the criteria, the material will not be imported and used at the Site and the Contractor will identify a different source for the fill or capping material. Inspection and testing will be required for any additional sources that are identified

4.4. Groundwater Monitoring Well Replacement

Groundwater sampling and analysis to evaluate the long-term effectiveness of the remedial action will be performed following the completion of the remedial action. New groundwater monitoring wells will be installed at the conditional point of compliance located adjacent to the Thea Foss Waterway as part of the American Plating Site Remediation Project that will be used for future compliance monitoring.

Monitoring wells currently present at the Site will be decommissioned as part of the remedial action to facilitate remedial construction activities (Figure 3). The existing monitoring wells will be decommissioned by a Washington State licensed driller in accordance with the Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC). The well logs for the existing wells that are to be decommissioned are provided in Attachment 5.

New, replacement monitoring wells will be installed to allow characterization of shallow groundwater quality conditions at the approximate locations of existing monitoring wells MW-3, MW-4 and MW-5 (Figure 3). Drilling and construction of the replacement monitoring wells will be conducted by a Washington State licensed driller in accordance with the Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC) and observed by a licensed geologist. Monitoring well borings will be drilled using a hollow-stem auger drill rig. The monitoring wells are to be installed to depths between approximately 15 and 20 feet bgs. The Engineer will provide a licensed geologist to monitor and log the borings and well installation.

4.5. Compliance Monitoring

Compliance monitoring will be implemented during the Site remedial action in accordance with the CAP (GeoEngineers, 2003), Compliance Monitoring Plan provided in Attachment 4, and WAC 173-340-410. The three types of compliance monitoring to be conducted include protection monitoring, performance monitoring, and confirmational monitoring. The objectives of compliance monitoring are to protect human health and the environment during the remedial action (protection monitoring), verify that cleanup standards have been achieved and, if appropriate, that other

performance standards have been achieved such as monitoring necessary to demonstrate compliance with a permit or substantive requirements of other programs (performance monitoring), and confirm the long-term effectiveness of the remedial action (confirmational monitoring). Compliance monitoring activities are described in the following sections.

4.5.1. Protection Monitoring

Protection monitoring will include monitoring of worker health and safety and environmental protection practices such as stormwater, erosion, and sediment controls. The purpose of protection monitoring is to confirm that human health and the environment are adequately protected during the remedial action.

4.5.1.1. WORKER HEALTH AND SAFETY

Remediation-related construction activities will be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (WISHA) (RCW 49.17) and the Federal Occupational Safety and Health Act (OSHA) (29 CFR 1910, 1926). These regulations include requirements that workers are to be protected from exposure to contaminants. A site-specific Health and Safety Plan (HASP) applicable to GeoEngineers' work is included as Appendix A of the Compliance Monitoring Plan (Attachment 4). The FWDA's selected construction Contractor will be required to prepare and submit a separate HASP for use by the Contractor's personnel. Personnel engaged in work that involves hazardous material excavation and handling shall comply with the provisions of WAC 173-340-810 (MTCA Cleanup Regulation, Worker Safety and Health) and be HAZWOPER, OSHA and/or WISHA certified.

4.5.1.2. ENVIRONMENTAL PROTECTION

Environmental protection measures consisting of best management practices (BMPs) for stormwater, sediment, drainage, and erosion control; spill prevention and pollution control; and all other controls needed to protect environmental quality during remedial actions will be implemented. Environmental protection measures including a Spill Prevention, Control and Countermeasure (SPCC) Plan will be prepared and provided by the selected Contractor in the Contractor's submittal package. The Contractor will be required to conform to all permits for the project and implement the Stormwater Pollution Prevention Plan (SWPPP) (Attachment 8) including the installation, inspection and maintenance of BMPs necessary for stormwater management, temporary erosion and sediment control measures, and SPCC measures, as necessary, for the duration of the project. If the FWDA or any governmental agency determines that the Contractor's environmental protection measures are inadequate to meet the intent of applicable regulations, the Contractor will be required to implement additional stormwater runoff, erosion control, and/or SPCC measures to address the deficiencies.

4.5.2. Performance Monitoring

Performance monitoring will be conducted to verify that the remedial action attains the cleanup levels established for the Site as well as other performance standards including characterization and monitoring necessary to demonstrate compliance with permit, disposal, and discharge requirements. Performance monitoring to be performed as part of the remedial action includes the following:

- Backfill and capping material characterization;

- Limits of remedial excavation verification;
- Soil stockpile characterization for disposal; and
- Water characterization prior to discharge.

The following sections further describe performance monitoring to be performed at the Site as part of the remedial action.

4.5.2.1. BACKFILL AND CAPPING MATERIAL CHARACTERIZATION

The contractor selected to perform remedial activities will identify the source or sources (i.e., borrow pits, supplier facilities, etc.) that are proposed to provide backfill and capping materials and shall also provide the results of grain-size distribution (ASTM International [ASTM] D 422) and modified Proctor (ASTM D 1557) tests performed on all proposed types of backfill and capping material from the identified sources. GeoEngineers personnel shall perform an inspection of the proposed backfill and capping material sources and collect samples to chemically characterize the backfill and capping material. Chemical analyses will be performed on the material to evaluate whether the material meets the cleanup levels for unrestricted land use. Chemical analysis of the backfill and capping material and comparison of the analytical results to the unrestricted land use criteria shall be performed prior to the contractor importing the material to the Site. If the results from a specific backfill or capping material sample indicate the presence of one or more chemicals at concentrations greater than the cleanup levels, the material will not be imported and used at the American Plating Site.

4.5.2.2. LIMITS OF REMEDIAL EXCAVATION VERIFICATION

Remedial excavation will be performed in two areas at the Site to remove soil that was identified to contain metals at concentrations greater than the Toxicity Characteristic criteria (WAC 173-303-090). Soil sampling and analysis will be performed at the limits of the remedial excavations to verify removal of soil with concentrations greater than Toxicity Characteristic criteria.

Where the verification sample results are less than the Toxicity Characteristic criteria, no further excavation will be performed. Where the verification sample results are greater than the criteria, additional excavation will be performed to remove soil with concentrations greater than the criteria. Following any additional excavation, additional verification samples will be collected and analyzed to verify that the remaining soil meets the criteria. Ecology shall be notified of any additional actions (i.e., additional excavation and sampling) to be performed in response to the verification sample results.

4.5.2.3. SOIL STOCKPILE CHARACTERIZATION FOR DISPOSAL

The soil excavated from the remedial excavations and utility corridors will be stockpiled for characterization prior to disposal. The stockpile area will be bermed and lined with plastic which will be secured beneath the stockpile area as well as covered with plastic. Samples of stockpiled soil removed from the excavations will be collected and analyzed to characterize the stockpiled soil for disposal. The results from stockpiled soil sampling and analysis will be compared to landfill disposal criteria to identify the appropriate disposal location. Sampling and analysis, comparison of the sample results to landfill criteria, and acceptance of the stockpiled material by the landfill will be performed/obtained prior to transport of the stockpiled soil to a landfill for disposal.

4.5.2.4. WATER CHARACTERIZATION PRIOR TO DISCHARGE

All stormwater that is collected as part of the remedial action and any water resulting from dewatering of excavations or excavated material, dust control, and decontamination activities on the Site will be discharged to the City of Tacoma sanitary sewer. Samples of the water will be collected and analyzed to characterize the water for discharge to the City of Tacoma sanitary sewer. The results of water sampling and analysis will be compared to the requirements of a City of Tacoma Special Approved Discharge (SAD) to the sanitary sewer. Sampling, and analysis, comparison of the sample results to the SAD requirements, and City of Tacoma approval for discharge will be performed/obtained prior to discharge to the sanitary sewer.

4.6. Analyses to Support Compliance Monitoring

Chemical analyses will be performed on backfill and capping materials, Site soil and excavated materials, and water as part of compliance monitoring during the American Plating Site Remediation Project. The chemical analyses will be performed by an Ecology-approved analytical laboratory identified by the Engineer and contracted to the Contractor. Samples for chemical analysis will be collected by the Engineer and submitted to the analytical laboratory. The results from the chemical analyses will be used to evaluate compliance with the requirements identified in the CMP as well as the requirements specified in the contract documents.

5.0 CONTRACT WORK

This section presents an overview of the work to be performed to complete the remaining remedial actions at the American Plating Site as part of the American Plating Site Remediation Project. The Contractor shall perform the work in accordance with the contract documents, project specifications provided in the following sections, as well as the project plans detailing the work presented on Sheets C-1 through C-18.

The work generally consists of the following:

- Mobilization to and Demobilization from the Site.
- Site preparation activities including establishing Site controls and security measures and implementation of temporary erosion and sediment controls and stormwater pollution prevention measures.
- Protection of underground and above ground utilities and structures at the Site.
- Demolition.
- Remedial excavation and backfill.
- Utility corridor excavation and backfill.
- Material management, loading, transport, and disposal, or recycling.
- Site grading and capping.
- Site restoration.
- Compliance monitoring.

- Quality assurance/Quality control
- Health and Safety

The Contractor shall phase and stage work so as to meet or exceed the project schedule while not impacting adjacent business operations. The Contractor shall conduct the work in a manner that causes the least possible obstruction and inconvenience to surrounding businesses including Berg Scaffolding who's operations occur on the parcel located south of the American Plating Site (i.e., FWDA Parcel # 895001 791). The Contractor's operations shall at no time obstruct access by Berg Scaffolding employees and clients. The Contractor shall furnish, erect and maintain temporary fences, vehicular barricades, signs, lights, and cones as may be necessary to control access to adjacent streets and to warn the public and on-site personnel of work in progress as well secure the Site from general public access. The Contractor shall be aware that any impacts or damage to Berg Scaffolding business operations and any adjacent property caused by the Contractor during the work will be corrected or repaired at the Contractor's sole expense. Additionally, any damage or impacts to the Thea Foss Waterway or the previously completed remediation of the Thea Foss Waterway and/or any penalties and monetary fines as a result of impacts or affects to the Thea Foss Waterway or previously completed remediation of the Thea Foss Waterway caused by the Contractor during the work or arising from the Contractor's operations shall be corrected, repaired, and borne by the Contractor at the Contractor's sole expense.

The Contractor shall coordinate all work with the Project Engineer. Coordination with the Project Engineer will include allowing the Engineer to perform observations of the work, attend project meetings and collect samples for physical and/or chemical analysis. The Engineer anticipates collecting samples for analysis from the following at a minimum:

- The Contractor's proposed sources of backfill and capping material;
- Soil at the limits (i.e., base and sidewalls) of the two areas that are excavated to remove soil with contaminant concentrations greater than Toxicity Characteristic criteria;
- Stockpiled soil resulting from the two remedial excavations and from utility corridors excavations as well as materials resulting from clearing and grubbing activities; and
- Water resulting from excavation and excavated material dewatering and stormwater collection as well as any water resulting from dust control and decontamination procedures that is contained and treated prior to discharge to the City of Tacoma sanitary sewer system.

The Contractor shall be aware that chemical and/or physical analysis may take up to seven working days to complete. The Engineer will submit all samples to an Ecology-approved laboratory on a one-week turnaround time to facilitate performance of the work. The Contractor shall plan the work around the required sampling and analysis to continue progress toward completion of the project.

The Contractor shall establish a contract with the laboratory that is identified by the Engineer to perform chemical analyses. Cost for chemical analyses performed as part of the American Plating Site Remediation Project will be paid for through an allowance. The Contractor shall be provided a 10 percent (10%) markup on the analytical costs invoiced to the Contractor by the analytical laboratory. The markup on the analytical costs provided to the Contractor will be for all costs,

including but not limited to, overhead, administrative, and management of the laboratory performing the analyses.

The following sections provide the project specifications for the contract work.

6.0 REGULATORY AND PERMITTING REQUIREMENTS

The Contractor shall comply with the regulatory and permitting requirements identified in the following section during performance of the work. Compliance with the permitting and regulatory requirements identified in the following section as well as any other regulatory or permitting requirements identified in the contract documents or necessary to complete the work will be incidental to the work performed as part of the American Plating Site Remediation Project.

6.1. References

All work performed as part of the American Plating Site Remediation Project shall be completed in accordance with the Contract Documents, the requirements specified in this document, and, insofar as they may apply, the most current requirements of the following agencies, organizations, codes, specifications, standards and guides, as well as others as specified elsewhere in these specifications:

- American Conference of Governmental Industrial Hygienists (ACGIH)
- American Public Works Association (APWA)
- American Society for Testing and Materials (ASTM)
- Environmental Protection Agency (EPA)
- Hazardous Waste Operations and Emergency Response (HAZWOPER)
- Model Toxics Control Act (MTCA)
- National Institute of Occupational Safety and Health (NIOSH)
- Occupational Safety and Health Administration (OSHA)
- Washington Administrative Code (WAC)
- Washington Industrial Safety and Health Act (WISHA)
- Washington State Department of Transportation (WSDOT)

6.2. Regulatory and Permitting Requirements

The American Plating Site Remediation Project is being performed pursuant to MTCA under the terms of the Prospective Purchaser Consent Decree. Therefore, the remedial action is exempt from the procedural requirements of certain laws, regulations, and all local permits (WAC 173-340-710[9][a]). However, the remedial action must comply with the substantive requirements of the laws, regulations, and permits. Regulatory requirements, permits, and substantive requirements applicable to the work are presented in the following sections.

6.2.1. Solid and Hazardous/Dangerous Waste Management

Trash, debris, and soil will be generated from Site preparation, demolition, and excavation of soil exceeding Site cleanup levels as well as excavation of utility corridors. The material that is generated will be disposed of as solid or Hazardous/Dangerous Waste based on the material sources and characteristics.

Trash and debris present at the Site, that is not recycled or reused, will be collected and disposed of off site as solid waste at a Subtitle D landfill approved by the Engineer. The trash and debris will be collected and disposed of separate from material excavated from the remedial and utility corridor excavation areas at the Site.

Material that is excavated from the two remedial excavation areas (REAs) as well as the three utility corridor areas (UCAs) will be placed in separate stockpiles (i.e., five distinct stockpiles).

The Washington State Dangerous Waste Regulations (Chapter 173-303 WAC) may apply to the material generated during excavation of the REAs and UCAs at the American Plating Site. Analytical data for soil generated during previous investigations at the Site contained metals at concentrations greater than Dangerous Waste Toxicity Characteristic criteria.

Sampling and analysis of stockpiled material removed from excavations will be performed to evaluate whether contaminants present in the material will result in the material being designated as "characteristic" Dangerous Waste (WAC 173-303-090). Stockpile samples will be analyzed for contaminants of concern. Material has the potential to designate as a Dangerous Waste if the total contaminant concentration is greater than 20 times[1] the associated Toxicity Characteristic Criteria listed in WAC 173-303-090(8).

Material that designates as a Dangerous Waste, will be managed by the Contractor in accordance with Washington State Dangerous Waste Regulations (Chapter 173-303 WAC). Material that designates as Dangerous Waste will be stored, handled, manifested, and transported in accordance with Dangerous Waste Regulations. The Washington State Dangerous Waste Site Identification number for the American Plating Site is Site ID No. WAD083350231. Material that does not designate as a Dangerous Waste will be managed and disposed of by the Contractor as solid waste and transported to a Subtitle D Landfill approved by the Engineer.

Draft waste disposal profiles and preliminary landfill use authorizations for disposal at a Republic Services, Roosevelt Regional Municipal Solid Waste Landfill (i.e., Subtitle D Landfill) and Chemical Waste Management Landfill in Arlington, Oregon (i.e., Subtitle C Landfill) are provided in Attachment 6. Final landfill use authorizations will be obtained by the Engineer based on the results of stockpile sampling and analysis prior to transport and disposal.

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[1] This is referred to as the "20-times rule" and is described in a September 21, 1992 EPA letter titled "Calculation of TCLP Concentrations from Total Concentrations". This reference is available at http://yosemite.epa.gov/osw/rcra.nsf/ea6e50dc6214725285256bf00063269d/95e9e57b91ea2e9f8525670f006c0acd!OpenDocument

6.3. State Environmental Policy Act

The State Environmental Policy Act (SEPA) (Revised Code of Washington [RCW] 43.21C; WAC 197-11) and the SEPA procedures (WAC 173-802) are intended to ensure that state and local government officials consider environmental values when making decisions. Because the cleanup action is being performed under a Prospective Purchaser Consent Decree, SEPA and MTCA requirements are being coordinated. Ecology is the lead SEPA agency for the remedial action at the American Plating Site.

FWDA completed a SEPA checklist and furnished a copy to Ecology on November 17, 2003. A Determination of Nonsignificance (DNS) was issued by Ecology as the project was determined to not have a probable significant adverse impact on the environment. The DNS was issued on December 29, 2003. The SEPA checklist for the project and DNS is provided in Attachment 7.

6.3.1. Erosion and Sediment Control and Water Management

Water management and erosion and sediment control for the protection of surface water during the work will be conducted in accordance with the requirements of the Washington State Water Pollution Control Act (RCW 90.48) as described in the Construction Stormwater General Permit as well as the construction Stormwater Pollution Prevention Plan (SWPPP) developed for the Site. The Construction Stormwater General Permit and construction SWPPP are provided in Attachment 8.

A Construction Stormwater General Permit is required at construction sites for clearing, grading, and excavation that results in the disturbance of one or more acres and where stormwater discharges to surface waters of the State. The Construction Stormwater General Permit is administered by Ecology. The permit is applicable to the work at the American Plating Site because more than one acre of disturbance will occur as part of the remedial action project and stormwater discharges to surface water. Work performed by the Contractor will comply with the provisions of the general stormwater permit and the project specific SWPPP. A Notice of Intent for application for a Construction Stormwater General Permit was submitted to Ecology on October 24, 2011. The Construction Stormwater General Permit was received from Ecology on December 15, 2011. The Construction Stormwater General Permit requires that all stormwater runoff be collected and treated prior to discharge.

Additional water that may be generated as part of the work at the American Plating Site includes, but is not limited to, groundwater resulting from dewatering during excavation activities, dust control water, and water resulting from decontamination activities. The Contractor shall be aware that all water generated as part of the remedial actions, including stormwater runoff, will be collected and treated, as necessary, and discharged to the City of Tacoma Sanitary Sewer in accordance with the City of Tacoma Municipal Code Chapter 12.08 under a Special Authorization Discharge (SAD) permit. The SAD permit application is provided in Attachment 9. The water will be sampled by the Engineer and analyzed for the parameters specified in the SAD permit prior to discharge. The analytical results will be compared to the permit criteria by the Engineer to ensure that the water meets the criteria prior to discharge to the City of Tacoma sanitary sewer system.

6.3.2. City of Tacoma Critical Areas Ordinance

The City of Tacoma Critical Areas Ordinance was developed under the directives of the Washington State Growth Management Act to designate and protect critical areas. Critical areas are defined as wetlands, aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas. Because the work is being implemented pursuant to a Prospective Purchaser Consent Decree, under WAC 173-340-710(9)(a), the work is exempt from the procedural requirements of the Critical Areas Ordinance. However, the substantive requirements of the Critical Areas Ordinance are to be met by the remedial action project.

6.3.3. City of Tacoma Grading Permit

Grading permits are used by the City of Tacoma for excavation and/or fill work. Under the MTCA Permit Exemption the work to be performed as part of the American Plating Site Remediation Project is exempt from the procedural requirements of the Grading Permit. However, the substantive requirements are applicable to the work as the work will include excavation for the removal of contaminated soil and installation of utility corridors as well as grading and filling the Site to complete Site capping. The substantive requirements of the Grading Permit will be met by remedial contractor during the Site work.

Substantive grading and excavation requirements include, but are not limited to, the following:

- The excavation and grading surface shall be no steeper than is safe for the intended use.
- Detrimental amounts of organic material shall not be permitted in backfill materials.
- The faces of cut and fill slopes shall be prepared and maintained to control against erosion. This control may consist of covering the areas with plastic sheeting or other BMPs. The protection for slope surfaces shall be installed as soon as practicable and maintained throughout excavation activities.

6.3.4. City of Tacoma Shoreline Regulations

Similar to the City of Tacoma's critical area requirements, the Contractor shall be prepared to meet the substantive requirements for shoreline regulations. At a minimum, the work shall include the following requirements:

- Measures to minimize erosion during and after the work and for the replanting of near shore areas of the Site after construction.
- Measures to minimize the problems of contamination of surface waters, depletion and contamination of groundwater, and the generation of increased surface water runoff.
- Provisions for facilities or appurtenances for disposal of sanitary waste and monitoring the use of chemicals, fertilizers, and other pollutants in such a manner so as to not degrade existing levels of surface water and groundwater quality.
- Dust control measures, including plants and vegetation where feasible, shall be taken.
- Signs required for safety and security shall be allowed. All signs shall be of permanent materials.

6.3.5. Puget Sound Clean Air Agency, Regulation I of the Puget Sound Clean Air Agency

The work shall be performed so as to not allow the emission of any air contaminants in violation of the visual standard, to not allow the emission of fugitive dust, and to not allow the emission of particulate matter in violation of the regulation. Equipment utilized on Site for the work shall be maintained in such a manner as to not be in violation of the regulation.

The numerical standards for compliance with air emissions regulations that apply to the work at the Site are those listed in Appendix A, Acceptable Source Impact Levels, of the regulation. Work at the Site will be performed using construction techniques to minimize dust and particulate emissions from the Site and maintain emissions below standards promulgated by the Puget Sound Clean Air Agency.

6.3.6. Other Applicable Regulatory Requirements

The following are other applicable regulatory requirements for the work to be performed at the American Plating Site:

- **Health and Safety** – Remediation-related work activities will be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (RCW 49.17) and the Federal Occupational Safety and Health Act (29 CFR 1910, 1926). The associated regulations include requirements that workers are to be protected from exposure to harmful concentrations of contaminants. The project health and safety requirements are identified in Section 19.
- **Minimum Standards for Construction and Maintenance of Wells –** Groundwater monitoring well decommissioning and installation of new monitoring wells are to be performed in accordance with the requirements identified in Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC). Groundwater monitoring wells currently present at the Site will be decommissioned by the Contractor during Site preparation activities. In addition, new monitoring wells will be installed by the Contractor as part of Site restoration activities.
- **Procedures for the Unanticipated Discovery of Cultural Resources** – An unanticipated discovery plan that outlines the procedures to be followed if archaeological materials or human remains are discovered has been prepared for the American Plating Site Remediation Project. The Plan and Procedures for the Unanticipated Discovery of Cultural Resources and Human Skeletal Remains is provided in Attachment 10. The procedures specified in the plan shall be implemented by the Contractor during the work.

7.0 EXISTING CONDITIONS

Existing Site conditions are summarized in this section and are shown on Sheet C1.0. The Contractor shall confirm all existing Site conditions prior to the Contractor submitting a bid for the American Plating Site Remediation Project.

Currently, portions of the American Plating Site (i.e., FWDA Authority Parcel # 895001761) are being used by Berg Scaffolding for storage of scaffolding materials and for equipment and vehicle

parking. The Contractor shall be aware that all Berg-related scaffolding materials, equipment, and vehicles will be removed by Berg Scaffolding prior to commencement of the work. The Contractor will have full access to the entire American Plating Site. The Contractor will not have access to or use of any portion of the property south of the American Plating Site that is Berg Scaffolding's office and main equipment storage area (i.e., FWDA Authority Parcel # 895001791) except as otherwise specified in these documents or the project plans.

The existing site grade is from an elevation of approximately 6.64 feet National Geodetic Vertical Datum (NGVD) 29 (i.e., approximately 13.0 feet Mean Lower Low Water [MLLW]) at the OHW line on the western boundary of the Site to approximately 11 feet NGVD 29 on the eastern boundary of the Site.

Chain-link fencing is present generally along the northern and eastern property boundaries and within the western portion of the Site. Chain-link fencing is not present along the southern boundary between the American Plating Site (i.e., FWDA Authority Parcel # 895001761) and Berg Scaffolding office and main storage yard (i.e., FWDA Authority Parcel # 895001791). A chain-link gate is located at the northeast corner of the Site that provides access to the Site from East D Street. Remnant sections of fencing are also present in various locations around the Site.

An asphalt road transverses the Site from East D Street that provides access to the American Plating Site as well as Berg Scaffolding office building, main storage area, and Berg business operations.

Areas of vegetation (i.e., trees, bushes, shrubs, and grass) are present on the northern, central, and western portions of the Site as well as in other areas around the Site. A cluster of cottonwood trees are present in the east-central portion of the Site. Additionally, approximately 540 cubic yards of soil is stockpiled just north of the cottonwood trees.

Trash and debris is present in various locations across the Site including within areas of vegetation. The trash and debris includes, but is not limited to, paper, metal, wood, asphalt, and concrete. Nine 55-gallon drums containing monitoring well purge water from semi-annual groundwater monitoring performed by Ecology are located on the northern boundary of the Site. The drums are to be removed and disposed of by Ecology prior to beginning Site work.

Remnant concrete and asphalt surfacing and concrete structures are also present in various locations across the Site. Remnant concrete foundations and a floor slab are present on the southwest portion of the Site. A row of concrete Ecology-blocks are also present on the southwest portion of the Site and a single Ecology-block is located on the shoreline. Remnant asphalt surfaces, concrete surfaces and concrete foundations are also present on the southeast portion of the Site.

Additionally, nine groundwater monitoring wells are currently present on the Site.

The Site is bounded by the following:

- The Foss Landing Marina and Boat Storage property borders the northern boundary of the Site. The work shall not impact parking access and not cause damage to this property.

- The Thea Foss Waterway and a habitat enhancement area constructed as part of the Thea Foss Waterway Remediation Project borders the western boundary of the Site. All work shall not encroach onto, impact, or damage these areas.
- As described above, Berg Scaffolding office, main storage area, and business operations border the southern boundary of the Site. The Contractor shall maintain access to Berg business operations during all work. The work shall not impact business access and not cause damage to this property.
- East D Street (including the East D Street overpass bridge) and a utility easement border the east boundary of the Site. The Contractor shall be prepared to maintain and protect the East D Street right-of-way (ROW) and utility easement during the work. Project work shall not impact City ROW access and not cause damage to this area. The Contractor shall not operate equipment or perform any other work within 10 feet of the East D Street overpass bridge.

8.0 HOURS OF OPERATION AND CONSTRUCTION STAGING AREA

The Contractor shall conduct its operations in a manner that causes the least possible obstruction and inconvenience to Berg Scaffolding business operations as well as the operations of other surrounding businesses. The Contractor shall coordinate, phase, and schedule all work so that it does not affect Berg Scaffolding or other business operations and is completed within the requirements of City of Tacoma code. No additional payment or claims of delay or other damages shall arise based on coordination, phasing, or scheduling of the work around Berg Scaffolding as well as other business operations or meeting the requirements of the City of Tacoma code during the work.

8.1. Work Hours

The work shall be performed during City of Tacoma-approved work hours. Exceptions to the allowable work hours may be made at the discretion of the City of Tacoma.

Berg Scaffolding's hours of operation are from 5:00 AM to 5:30 PM Monday through Friday. Additionally, Berg Scaffolding business operations also occur on weekends. Berg Scaffolding's weekend hours of operation are not established and vary based on business demand. The Contractor's work shall be performed to allow continued operation of Berg Scaffolding during Berg Scaffolding's hours of operation.

8.2. Noise

Construction noise including, but not limited to, noise generated by construction equipment, work activities, and personnel will be limited to City of Tacoma-approved work hours and meet the requirements of the City of Tacoma code, Chapter 8.122.080 and 8.122.090.

8.3. Construction Staging Area

The entire American Plating Site (i.e., FWDA Authority Parcel # 895001761), not including the area utilized to provide access for Berg Scaffolding personnel and clients for business operations at any given time, will be made available to the Contractor for construction staging. The Site is expected to be used by the Contractor for location of construction trailers, equipment parking and storage,

storage of supplies, and material management and containment areas as well as management and storage of all other equipment and materials required to perform the work.

The Contractor shall coordinate, as appropriate, project-related vehicle parking and truck staging (ex., while waiting to load or unload) either on site or along East D Street.

9.0 SITE ACCESS, TEMPORARY SITE CONTROLS, AND SECURITY

Access to the work area (entry and exit) will be from East D Street. An existing chain-link gate is located at the northeast corner of the work area on East D Street at the entrance to the Site as shown on Sheet C2.0. The Contractor will share the entrance to the Site with Berg Scaffolding throughout the work.

An access road is currently located at the entrance to the Site that provides access to the work area (i.e., FWDA Authority Parcel # 895001761) as well as Berg Scaffolding office building, main storage area, and Berg business operations (i.e., FWDA Authority Parcel # 895001791) as shown on Sheet C1.0. The Contractor shall maintain access to the Berg Scaffolding office building, main storage area, and Berg business operations (i.e., FWDA Authority Parcel # 895001791) by Berg Scaffolding personnel and clients throughout the work.

The Contractor shall coordinate, phase, and schedule all work to maintain access to the Berg Scaffolding office building, main storage area, and Berg business operations (i.e., FWDA Authority Parcel # 895001791) by Berg Scaffolding personnel and clients throughout the work. Any work that requires the obstruction of access by Berg Scaffolding personnel and clients shall be performed and completed outside of Berg Scaffolding's hours of operation. No additional payment or claims of delay or other damages shall arise based on coordination, phasing, or scheduling of work to maintain access by Berg Scaffolding personnel and clients.

The Site entrance and access will be stabilized (using quarry spalls or other relevant material) to minimize the tracking of sediment resulting from the work onto the East D Street. Street sweeping and street cleaning will be employed, as necessary, to prevent sediment from being tracked onto East D Street and/or from entering stormwater and state waters. Construction access for the work at the American Plating Site will be performed as shown on Sheet C2.0 and Sheet C2.1.

The Contractor will be responsible for providing and installing temporary Site fencing, barricades, signage, and other traffic control devices, as necessary, for controlling the work area. The Contractor shall furnish, erect and maintain temporary fences, vehicular barricades, signs, lights, and cones, as may be necessary to provide access to adjacent streets and the Berg Scaffolding office building, main storage area, and Berg business operations (i.e., FWDA Authority Parcel # 895001791); to warn the public, Berg Scaffolding personnel and clients, and construction personnel of work in progress; as well as provide for Site security throughout the work. Coordination of all traffic and traffic control devices shall be in accordance with the current City of Tacoma code. The Contractor shall coordinate all work with other Contractors in the area, as necessary. The work area not being utilized for access by Berg Scaffolding personnel and clients for business operations, shall be secured by the Contractor at all times to not allow access by

unauthorized personnel into the work area. The work area shall also be secured by fencing when the Contractor is not performing work to not allow access by unauthorized personnel.

The unit cost for work performed for Site Access, Temporary Site Controls, and Security will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for Site Access, Temporary Site Controls, and Security will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Site Access, Temporary Site Controls, and Security will be estimated percent completed. No additional payment or claims of delay or other damages shall arise based on coordination, phasing, or scheduling of the work around Berg Scaffolding as well as requirements to maintain Site Access, Temporary Site Controls, and Security during the work.

10.0 SITE PREPARATION

Site preparation shall be performed to support the work to compete the remedial actions at the Site. The work will be performed by the Contractor in accordance with the specifications in the following sections and as shown on Sheet C2.0, C2.1, and C2.2.

10.1. Erosion Control/Stormwater Pollution Prevention

The Contractor shall employ Best Management Practices (BMPs) to control erosion during all work including, but not limited to, Site preparation, demolition, excavation, backfilling, grading, capping, and restoration activities. The Contractor shall implement erosion control and stormwater pollution prevention BMPs consistent with the following:

- Washington State Department of Ecology Stormwater Management Manual for Western Washington (Ecology, 2005);
- The Construction Stormwater General Permit (Permit Number WAR-125447; Attachment 8); and
- Project Stormwater Pollution Prevention Plan (SWPPP) (Attachment 8).

The Contractor shall also implement erosion control and stormwater pollution prevention procedures in accordance with requirements of this section. Erosion control and stormwater pollution prevention procedures shall include the following:

- Installation and maintenance of temporary erosion and sediment control (TESC) measures as identified on Sheets C2.0, C2.1 and C2.2.
- Install stormwater inlet protection in catch basins potentially subject to Site runoff.
- Install stormwater controls such as silt fencing, protection barriers, swales, check dams and sediment traps, as needed, within the limits of work area to collect all stormwater runoff and to avoid any stormwater run-on into the work area. Stormwater controls shall be approved by the Engineer prior to placement.
- Remove sediment deposits when the deposits reach 6 inches above the pre-existing ground surface on the upgradient side of the TESC measures.

- Transfer or pump all water including stormwater runoff resulting from erosion and sediment control and stormwater pollution prevention activities into the water treatment system. All water including stormwater runoff will be captured prior to leaving the Site. The requirements for the water management and disposal and the water treatment system are described in Section 10.3.
- Maintain temporary access roadway as needed to allow access by Berg Scaffolding and to allow completion of all work.
- Clear only those areas where immediate activity will take place and maintain original ground cover as long as practicable.
- Implement dust control techniques, as necessary, for construction activities that could generate dust. Dust control techniques must be approved by the Engineer prior to application. Routine maintenance of the chosen dust control technique(s) is necessary to keep dust to a minimum and to meet Northwest Clean Air Agency restrictions of airborne particulates. The Contractor shall coordinate use of water sources from public or private sources, as necessary, to provide dust control. The Contractor is responsible for acquiring a water use permit, acquiring, installing, and maintaining any equipment necessary for use of permitted water sources, and any associated expenses, as required. Water applied as dust control shall not leave the Site as surface water runoff and will be collected and pumped into the water treatment system.
- Keep streets clean of construction debris, soil, fill material, and/or mud (i.e., sediment resulting from project work) associated with construction vehicles and equipment or any other construction activity. Any sediment resulting from the work that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment resulting from the work removed by sweeping shall be combined with soil transported off site for disposal. The pavement shall not be cleaned by washing down the street, except when sweeping is ineffective. Runoff from street washing must be collected and pumped into the water treatment system. If sediment resulting from the work is tracked onto off-site pavement areas, alternative measures to keep the streets free of sediment must be implemented.
- Maintain tire cleaning in accordance with BMP C105: Stabilized Construction Entrance (City of Tacoma Stormwater Manual). Construction entrance and exit routes shall be constructed, as necessary, to prevent tracking onto public streets. The surface material shall be 4- to 8-inch quarry spalls over a separation geotextile fabric. The geotextile must have a minimum grab tensile strength of 200 pounds per square inch (psi), a maximum grab tensile elongation of 30 percent and a 400 psi minimum Mullen Burst Strength, and shall conform to a 20 – 45 U.S. standard sieve size per ASTM International (ASTM) Standards D 4751, D 4632 and D 3786-80a. If the stabilized construction entrance/exit are implemented and proves ineffective in controlling the migration of sediment resulting from the work to off site areas, then BMP C106: Wheel Wash (City of Tacoma Stormwater Manual) or equivalent will be used in conjunction with the stabilized construction entrance/exit.

The unit cost for work performed for Erosion Control/Stormwater Pollution Prevention will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for Erosion Control/Stormwater Pollution Prevention will be measured on a lump sum unit

basis at the unit price shown on the bid form. Measurement for the lump sum item of Erosion Control/Stormwater Pollution Prevention will be estimated percent completed.

10.2. Stockpiled Materials Management Areas

The Contractor will construct stockpiled materials management areas for temporary stockpiling of contaminated soil and material generated as part of Site preparation, demolition, excavation, and other activities that may be contaminated and that will require characterization prior to off-site disposal. Material that requires temporarily stockpiling includes, but is not limited to, the following:

- Soil excavated from two areas with contaminant concentrations greater than Site cleanup levels;
- Soil removed from trenches excavated to construct utility corridors; and
- The component of Site vegetation resulting from clearing and grubbing that includes roots and Site soil.

These materials will be temporarily stockpiled in the material management areas to allow sampling and analysis by the Engineer and characterization of the material for off-site disposal.

Stockpiled materials management areas will be constructed in accordance with the requirements of this section and as shown on Sheet C2.1 as well as in accordance with the construction SWPPP (Attachment 8) to prevent contaminant releases to soil and water from the stockpiled material. The stockpiled material management areas will be constructed of Ecology blocks and lined with an impermeable barrier as detailed on Sheet C2.1. Stockpiled material will be covered and secured from wind, rain, and other disturbances to control dust, erosion, and contact with stormwater.

Excavated materials containing Site soil generated during clearing and grubbing (i.e., vegetation roots with soil) and each individual excavation (i.e., contaminated soil excavation areas and utility corridors) will be stockpiled separately and characterized for disposal. Depending on the results of characterization, the contaminated material will be loaded from the stockpiled materials management areas into containers and/or trucks for off-site disposal at a Subtitle D or Subtitle C landfill approved by the Engineer.

Some of the material may be wet, in which case the material will be dewatered within the stockpiled materials management area(s) prior to transport to an off-site disposal facility. Water generated from stockpiling of material will be removed and put into the water treatment system. The requirements for the water collection and treatment system are described in Section 10.3.

The unit cost for work performed for Stockpiled Materials Management Areas will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for Stockpiled Materials Management will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Stockpiled Materials Management Areas will be estimated percent completed.

10.3. Water Management and Disposal

The Contractor shall manage all water generated during the work performed at the Site. Water requiring management by the Contractor will include, but is not limited to, the following:

- Stormwater runoff collected at the Site;
- Dewatering water removed from excavations to remove contaminated soil, to construct utility corridors, and as part of Site grading;
- Water collected in the stockpiled materials management areas;
- Water resulting from runoff of dust control water; and
- Water generated as part of decontamination.

All water generated during Project work shall be collected, treated, and discharged to the sanitary sewer system operated by the City of Tacoma in accordance with the requirements of this section, the Tacoma Municipal Code (i.e., Chapter 12.08), and under a Special Authorization Discharge (SAD) permit. The SAD permit application for the American Plating Site Remediation Project developed based on coordination with the City of Tacoma is provided in Attachment 9.

The Contractor shall perform the following as well as other work, as necessary, as part of water management and disposal:

- Provide a Water Management Plan for water collection, treatment, and discharge that identifies the equipment and procedures to be used to control, collect, transfer, and treat all water generated during the work to meet or exceed the requirements of the contract document and discharge requirements of the Tacoma Municipal Code. This plan shall be submitted to the Engineer for review as well as the City of Tacoma as part of the SAD permit application for review and approval by the City of Tacoma prior to initiation of the work.
- Provide a suitable water storage and treatment system to manage all of the water generated during the work such that the water that is discharged meets the discharge criteria of the Tacoma Municipal Code and a SAD permit provided by the City for the project for discharge to the sanitary sewer system.
- Provide suitable water collection, transfer, and transport equipment so that all of the water generated during the work can be transferred from points of generation within the Site to the water storage and treatment system components and to the sanitary sewer manhole for discharge. Water from the water collection and treatment system shall be discharged at the City of Tacoma sanitary sewer manhole structure identified in the SAD permit application provided in Attachment 9.
- Provide, install and remove dewatering equipment, as necessary, to complete all work. The Contractor shall provide well points, pumps, and other equipment and materials, as necessary, to dewater excavation areas including, but not limited to, remedial excavation areas, utility corridor areas, and site grading and capping areas.
- Collect and treat all water from within the Site boundaries during all work and discharge treated water meeting the Tacoma Municipal Code effluent discharge criteria to the designated City of Tacoma sanitary sewer manhole indicated in the SAD permit application provided in Attachment 9.

- Provide an appropriate discharge flow monitoring system at the City of Tacoma sanitary sewer manhole in accordance with the Tacoma Municipal Code and a SAD permit provided by the City for the project.
- Be prepared to coordinate with the Engineer to implement the SAD permit requirements from the City of Tacoma for water discharge to the sanitary sewer. The Engineer shall perform sampling and testing of the water in accordance with the testing and frequency requirements of the SAD permit issued by the City and in accordance with the requirements of the CMP (Attachment 4). The Contractor is notified that analysis of the water samples will take up to 5 days to complete. The Contractor shall coordinate with the Engineer for sampling of the water and for discharge of the treated water after receipt and evaluation of chemical analysis of water prior to discharge to the City of Tacoma sanitary sewer system to ensure that the water meets the discharge requirements in the Tacoma Municipal Code and a SAD permit provided by the City for the project. The Contractor shall provide to the Engineer all documentation of the operation of the water treatment system as well as the records of discharge to the City of Tacoma sanitary sewer system in accordance with the Tacoma Municipal Code and a SAD permit to the Engineer.
- The water treatment system shall be equipped with readily accessible sampling ports for the Engineer to obtain water samples for chemical analysis. The Engineer shall perform sampling and characterization of the water to ensure that the water meets the discharge criteria.

The unit cost for work performed for Water Management and Disposal to mobilize components of the water collection and treatment system will include all labor, equipment, and materials necessary to transport and install as well as remove all of the components of the water collection and treatment system. Payment for Water Management and Disposal Mobilization will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Water Management and Disposal Mobilization will be estimated percent completed.

The unit cost for work performed for Water Management and Disposal to operate, manage, and discharge water from the water collection and treatment system to the sanitary sewer will include all labor, equipment, and materials to collect, transfer, contain, maintain, treat, transport, and discharge all water generated as part of the work as needed to complete the work described in this section including cost for discharge of the treated water to the City of Tacoma sanitary sewer system in accordance with the Tacoma Municipal Code and a SAD permit requirements. Payment for Water Management and Disposal Operations will be measured and paid for on a daily unit basis at the unit price shown on the bid form. The estimated number of days of operation is 21. The actual days of operation may be more or less than the estimated amount. The Contractor shall be paid based on the actual days of operation at the unit price shown on the bid form.

The unit cost for work performed for Water Management and Disposal for the disposal of water to the sanitary sewer will include all plans, permit application fees, and fees for disposal of water discharged to the City of Tacoma sanitary sewer system in accordance with the Tacoma Municipal Code and a SAD permit requirements. Payment for Water Management and Disposal for disposal of water to the sanitary sewer will be measured and paid for on a per gallon unit basis at the unit price shown on the bid form. The estimated number of gallons is 180,000. The actual gallons of

operation may be more or less than the estimated amount. The Contractor shall be paid based on the actual gallons at the unit price shown on the bid form.

The cost for analysis of samples of water collected from the water collection and treatment system shall be paid for from the Laboratory Analysis Allowance bid item. Laboratory invoices for analyses on water samples shall be submitted by the Contractor for measurement and payment. A markup of 10 percent will be assessed by the Contractor for laboratory analyses.

11.0 DEMOLITION

11.1. Utility Protection, Relocation, and Restoration

The Contractor shall locate all utilities present within the work area prior to any work that includes Site preparation, clearing, grubbing, excavation or any other activity that will disturb Site soil, structures, or other Site features that could damage existing Site utilities. A reasonable attempt was made to locate utilities at the Site based on the presence of surface features and review of available information for the Site during remedial design and the location of the utilities that were identified are shown on Sheet C1.0. However, the presence and exact location and depth of Site utilities is not certain. The Contractor is responsible for field-locating all existing utilities and shall use all appropriate methods to locate utilities present at the Site. Such methods may include, but are not limited to, subcontracting for utility locating services and potholing using safe-dig techniques (i.e., use of an air knife) prior to beginning work.

Any utilities in the vicinity of the remedial excavation areas and utility corridors will be protected, decommissioned, and/or temporarily disconnected and rerouted, as necessary, by the Contractor prior to and/or during excavation activities. Utilities will be rerouted and/or restored during and/or after completion of backfilling and restoration. The Contractor will also be responsible for notifying the appropriate agencies at least seven days prior to conducting excavation activities in the immediate vicinity of utilities and shall be responsible for obtaining necessary inspections.

The work performed for Utility Protection, Relocation, and Restoration will be incidental to other work that is performed as part of the American Plating Site Remediation Project.

11.2. Clearing and Grubbing

The Contractor shall clear and grub all areas to facilitate completion of the Site work. The Contractor shall confirm the location and quantity of all clearing and grubbing at the Site prior to submitting a bid for the American Plating Site Remediation Project.

Above ground components of Site vegetation will be segregated from components of Site vegetation that are in contact with or contain Site soil. The above ground components of Site vegetation, including the cottonwood trees present in the central portion of the Site will be removed, reduced in size as necessary, and managed in a manner to minimize contact with Site soil and segregated from other materials generated as part of Site work. The above ground components of vegetation, including the cottonwood trees, will be transported off site and disposed of as land clearing debris in accordance with the specifications in Section 14.

Roots, stumps, or any other component of Site vegetation in contact with Site soil will be removed and reduced in size as necessary, temporarily stockpiled in a stockpiled materials management area separate from other materials generated by Site work, and sampled by the Engineer to characterize the material for off-site disposal. The component of Site vegetation in contact with Site soil will be stockpiled separately and transported off site by the Contractor to a disposal facility approved by the Engineer in accordance with the specifications in Section 14.

The work performed for Clearing and Grubbing will include all labor, equipment, and materials as needed to remove, size as necessary, segregate, and stockpile the above ground components of vegetation and the components of Site vegetation in contact with or that contain Site soil to complete the work described in this section. Payment for Clearing and Grubbing will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Clearing and Grubbing will be estimated percent completed.

Measurement and payment for the work performed to transport and dispose of the material generated as part of Clearing and Grubbing is described in Section 14.

11.3. Existing Trash and Debris Collection

Trash and debris including, but not limited to, paper, wood, metal, remnant asphalt pieces, excluding the asphalt pavement comprising the access road, and concrete are present in areas across the Site including within and beneath existing areas of vegetation. The Contractor shall confirm the location and quantity of all trash and debris present at the Site prior to submitting a bid for the American Plating Site Remediation Project.

The Contractor shall collect and segregate, as necessary, trash and debris present at the Site. Some trash and debris is present in large pieces requiring it to be broken up or cut. Trash and debris consisting of paper, wood, and remnant asphalt pieces will be disposed of at Subtitle D solid waste landfill approved by the Engineer in accordance with the specifications in Section 14. Metal, where appropriate, may be recycled at a recycling facility approved by the Engineer. Concrete debris will be demolished to a maximum size of 8 inches in diameter and will be reused as backfill on site during Site grading in accordance with the specifications in Section 15.

The unit cost for work performed for Existing Trash and Debris Collection will include all labor, equipment, and materials as needed to collect, size as necessary, segregate, and stockpile trash and debris to complete the work described in this section. Payment for Existing Trash and Debris Collection will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Existing Trash and Debris Collection will be estimated percent completed.

Measurement and payment for the work performed to transport and dispose of the trash and debris that is collected as part of Existing Trash and Debris Collection is described in Section 14.

11.4. Monitoring Well Decommissioning

The Contractor shall decommission monitoring wells MW-1 through MW-5, MW-7, MW-9, MW-10, and MW-12 that are present at the Site as shown on Sheet C1.0. The monitoring wells will be decommissioned by a driller licensed in the State of Washington in accordance with the Regulation

and Licensing of Well Contractors and Operators (Chapter 173-162 WAC). The monitoring wells will be protected from damage prior to decommissioning.

Monitoring wells MW-2, through MW-5, MW-7, MW-9, and MW-10 have been located and are present where shown on Sheet C1.0. Monitoring wells MW-1 and MW-12 have not been located but are believed to exist approximately at the locations shown on Sheet C1.0. The well logs for the wells that are to be decommissioned are provided in Attachment 5. The Contractor shall attempt to locate monitoring wells MW-1 and MW-12 prior to initiating any well decommissioning activities. The Contractor shall notify the Engineer of the schedule for attempting to locate monitoring wells MW-1 and MW-12 to allow the Engineer to be present during well locating activities. The Contractor shall use all appropriate methods to locate monitoring wells MW-1 and MW-12. Such methods may include, but are not limited to, clearing and grubbing, subcontracting for utility locating services and potholing prior to beginning the well decommissioning activities.

The wells will be decommissioned in accordance with the requirements of the Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC). The Contractor shall provide the Engineer with monitoring well decommissioning documentation prepared by the licensed driller.

The unit cost for work performed for Monitoring Well Decommissioning will include all labor, equipment, and materials as needed to locate and decommission the existing monitoring wells, and dispose of any resulting debris to complete the work described in this section. Payment for Monitoring Well Decommissioning will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Monitoring Well Decommissioning will be estimated percent completed.

Any debris generated as a result of work performed for Monitoring Well Decommissioning will be managed and disposed of in accordance with the specifications in Section 14.

11.5. Removal of Existing Fencing

The Contractor shall remove all existing fencing located within the Site boundaries as shown on Sheet C2.0. The Contractor shall also temporarily remove existing fencing located along the Site boundaries, as necessary, to complete the work including but not limited to, Site preparation, demolition, excavation, backfilling, grading and capping. Temporary fencing will be installed by the Contractor, as necessary, to maintain Site controls and secure the Site during all work activities in accordance with the specifications in Section 9.0.

All existing chain-link fencing and associated hardware shall be removed, stored, and protected so that it can be reused during Site restoration. The chain-link fencing and hardware shall be reused and reinstalled as part of Site restoration in accordance with the specifications in Section 16.6 and as shown on Sheet C5.0 and C5.2. Any chain-link fencing and hardware that is not utilized as part of Site restoration shall be recycled at a facility approved by the Engineer in accordance with the specifications in Section 14

The unit cost for work performed for Removal of Existing Fencing will include all labor, equipment, and materials as needed to remove, store, and protect fencing to complete the work described in

this section. Payment for Removal of Existing Fencing will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Removal of Existing Fencing will be estimated percent completed.

Any debris generated as a result of work performed for Removal of Existing Fencing will be managed and disposed of in accordance with the specifications in Section 14

11.6. Demolition of Asphalt and Concrete Surfaces and Structures

The Contractor shall demolish all asphalt and concrete surfaces as well as concrete foundations, footings, and other structures within the Site boundaries to allow excavation, grading and capping of the Site. The approximate locations of surfacing, foundations, footings, and other structures to be demolished are shown on Sheet C2.0. The Contractor shall confirm the location and quantity of all surfacing, foundations, footings and other structures present at the Site prior to submitting a bid for the American Plating Site Remediation Project.

The Contractor shall saw cut asphalt and concrete surfaces as well as concrete foundations, footings, and other structures, as necessary, along the property lines to allow demolition and completion of work on the American Plating Site and to prevent impacts to asphalt and concrete surfaces and structures on adjacent properties. The locations where saw cutting is to be performed are presented on Sheet C2.0.

The asphalt debris resulting from demolition of the access road will be segregated from asphalt debris resulting from trash and debris collection and demolition of other remnant asphalt surfaces performed as part of the work described in this section. Asphalt debris resulting from demolition of the asphalt access roadway shall be transported to an appropriate construction debris receiving facility approved by the Engineer in accordance with the specifications in Section 14. All asphalt debris resulting from demolition of remnant asphalt surfaces will be disposed of at a Subtitle D solid waste landfill approved by the Engineer with asphalt debris resulting from Existing Trash and Debris Collection in accordance with the specification in Section 14. Residual soil present on remnant asphalt shall be physically removed prior to loading for offsite disposal.

Concrete surfaces, foundations, footings, and other structures will be demolished to a maximum size of 8 inches in diameter. Remnant concrete foundations, footings, and other structures will be demolished to an elevation that is three feet below the finished Site grade to allow containment beneath the complete thickness of the cap placed at the Site. The demolished concrete will remain on site and be used to establish Site grades prior to capping.

The gravel base course present beneath and adjacent to the existing asphalt pavement access road will be removed and stockpiled as part of demolition. The gravel base course present beneath and adjacent to the existing asphalt pavement access road will be reused as backfill in excavation areas including the excavations to remove soil with contaminant concentrations greater than the Site cleanup levels and where appropriate, as backfill for the utility corridors in accordance with the specifications in Section 13.4. The gravel base course shall be removed down to the Site soil surface. A geotextile is anticipated to present between the gravel base course and Site soil surface that will identify the limits of gravel to be reused as backfill. Where the geotextile is present, as well as any areas were the geotextile is not present, the Contractor shall remove the

gravel base course in a manner that does not include the inclusion of Site soil with the gravel. The gravel base course material that is temporarily stockpiled, shall be stockpiled separate from Site soil, trash and debris, or other materials being temporarily stored prior to disposal.

The unit cost for work performed for Demolition of Asphalt and Concrete Surfaces and Structures will include all labor, equipment, and materials as needed to saw cut, demolish, size as necessary, asphalt and concrete surfaces and structures, and excavate, segregate and stockpile gravel base course and demolished asphalt and concrete materials described in this section. Payment for Demolition of Asphalt and Concrete Surfaces and Structures will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Demolition of Asphalt and Concrete Surfaces and Structures will be estimated percent completed.

Measurement and payment for the work performed for Demolition of Asphalt and Concrete Surfaces and Structures to load, transport, and dispose of material generated as part of Demolition of Asphalt and Concrete Surfaces and Structures is described in Section 14.

12.0 REMEDIAL EXCAVATION AND BACKFILL

Remedial excavation shall be performed in two areas where contaminant concentrations are greater than Site cleanup levels. The two remedial excavation areas are designated Remedial Excavation Area (REA) 1 and REA 2 for the purposes of these contract documents. Material will be excavated from the two remedial excavation areas at the Site as shown on Sheet C3.0. Excavation at REA 1 and REA 2 is estimated to include removal of approximately 200 in-place tons. The actual quantities of excavated material to be removed from REA 1 and REA 2 may be greater or less than estimated based on the results of field screening and verification sampling at the remedial excavation limits.

The Contractor shall initially excavate REA 1 and REA 2 to the limits shown on Sheet C3.0 and notify the Engineer. The Engineer shall observe the limits of the excavation areas to determine whether additional excavation is warranted based on visual observation of contamination. The Engineer will provide the Contractor direction if additional excavation is warranted based on visual observation of contamination. Upon completion of excavation in each remedial excavation area based on visual observation of contamination, the Engineer will sample the remedial excavation sidewalls and bottom. The samples will be submitted by the Engineer to a laboratory for chemical analysis. The Engineer will inform the Contractor when the limits of the remedial excavations have been reached, based on the results of chemical analyses of sidewall and bottom samples collected from the limits of the excavations. The Contractor shall survey the final horizontal and vertical limits of the excavations and backfill the excavations after receiving approval from the Engineer.

The following sections include the methods and procedures for excavation, verification sampling, and backfilling and compaction of backfill materials.

12.1. Remedial Excavation

The Contractor shall perform the remedial excavation using commonly available excavation methods. The Contractor's excavation procedures shall include the following:

- The Contractor shall locate all utilities present within the remedial excavation areas prior to any work that could damage existing Site utilities. The Contractor is responsible for field-locating all existing utilities and shall use all appropriate methods to locate utilities present at the remedial excavation areas. Such methods may include, but are not limited to, subcontracting for utility locating services and potholing using safe-dig techniques (i.e., use of an air knife) prior to beginning work.
- Any utilities in the vicinity of the remedial excavation areas will be protected, decommissioned, and/or temporarily disconnected and rerouted, as necessary, by the Contractor prior to and/or during excavation activities. Any utility rerouting and/or restoration will be performed during and/or after completion of backfilling and restoration at the expense of the Contractor. The Contractor will be responsible for notifying the appropriate agencies at least seven days prior to conducting excavation activities in the immediate vicinity of utilities and shall be responsible for obtaining all necessary inspections and approvals for utility protection, removal, rerouting, and restoration.
- The Contractor shall complete clearing and grubbing and demolition in the remedial excavation areas, including, but not limited to, demolition of the asphalt pavement access road and removal of the gravel base course prior to initiation of remedial excavation activities.
- The Contractor shall stake the remedial excavation boundaries shown on Sheet C3.0 prior to excavation activities and protect and preserve the survey stakes during the work.
- The Contractor shall initially excavate materials from REA 1 and REA 2 to the horizontal and vertical limits shown on Sheet C3.0, C4.2, and C4.3 and stockpile the materials from each area separately in stockpiled materials management areas. REA 1 shall initially be excavated to a depth of 3 feet bgs. REA 2 will initially be excavated to a depth of 2 feet bgs. The excavation sidewalls shall not initially be sloped unless required to meet WISHA or OSHA requirements. The Engineer will observe excavation activities and provide guidance on excavated material segregation within the stockpiled materials management areas.
- The Contractor shall be solely responsible for excavation slope stability. Excavation work shall be performed in compliance with applicable regulations and in accordance with the Contractor's HASP.
- If necessary, the Contractor shall provide all materials, labor and equipment necessary to shore remedial excavations to protect the work, existing property, utilities, pavement, and any other structures and to provide safe working conditions in the excavation as per WSDOT Standard Specification 7-08.3(1)B and in compliance with applicable local, state or federal safety codes. Shoring plans will be submitted to the Engineer for review before any shoring is installed. Damage resulting from improper shoring or failure to shore shall be the sole responsibility of the Contractor.
- The Contractor shall be aware that the surface and subsurface at the Site consists of fill materials including, but not limited to, soil, concrete, asphalt, wood debris as well as other miscellaneous debris.
- Debris may be present in large pieces and/or masses and may include remnant components of previous structures including, but not limited to, concrete foundations, piping, as well as building materials. The Contractor shall provide appropriate equipment for excavating,

demolishing, handling, and stockpiling these and other materials. Concrete foundations, footings or other structures present in the remedial excavations will be excavated, demolished, and stockpiled with soil and other debris removed from the remedial excavation.

- Prevent odors and generation of dust or loss of materials during remedial excavation in accordance with the City's ordinance(s) or as directed by the Engineer.
- Prevent cross-contamination and re-contamination of remediated areas and any portion of the Site outside the remedial excavation areas. At the determination of the Engineer, the Contractor shall excavate any cross-contaminated and/or re-contaminated material at the Contractor's expense.
- Perform remedial excavation in a manner that does not disturb or damage existing structures, utilities, or other facilities not indicated to be removed. Damaged structures, utilities, or other facilities shall be repaired or replaced at the Contractor's expense as determined by the Engineer.
- Support any active utilities adjacent to remedial excavation areas, as necessary, during excavation activities to prevent damage to any utility or unsafe working conditions.
- Where excavation of materials in the vicinity of any existing active utilities proves to be exceedingly hazardous, utilize safe dig technologies (air knife, vacuum truck potholing, etc.) to the extent practicable.
- Decommission, remove and stockpile any remnant utilities within the limits of the remedial excavations during excavation activities. Any remnant utility pipes shall be plugged at the exposed ends for a distance of 2 diameters with commercial concrete. Care shall be used in placing the concrete in the utility to see that the opening is completely filled and thoroughly plugged.
- Allow and provide safe access to the Engineer for observation during remedial excavation work. Excavate additional materials beyond the horizontal and/or vertical limits shown on Sheet C3.0, if there are visual observations indicating that soil at the limits of the remedial excavations is contaminated and stockpile with previously excavated and stockpiled material from the same location. The Contractor shall perform this additional excavation only as directed by the Engineer.
- Allow and provide safe access to the Engineer for collection of samples during remedial excavation work. Assist the Engineer in obtaining samples from the sidewalls and base of remedial excavation areas during the excavation whenever exposed areas of the excavation are not readily accessible for such sampling activities. Excavate additional materials beyond the horizontal and/or vertical limits shown in Sheet C3.0, if the verification sample analysis results indicate that soil at the limits of the remedial excavation(s) exceed the cleanup levels and stockpile with previously excavated and stockpiled material from the same location. The Contractor shall perform this additional excavation only as directed by the Engineer.
- If water is encountered in a remedial excavation, the contractor shall remove, control, contain, and treat the water prior to discharge to the City sanitary sewer system in accordance with the Tacoma Municipal Code and SAD permit requirements and the requirements in Section 10.3.

- The Contractor shall not backfill the remedial excavation areas until the areas have been approved by the Engineer for backfill. Conditions to be achieved for backfill approval include, but are not limited to the following;
    - Achieving the total depth and horizontal extent of contaminated material removal based on visual observation and completion of verification sampling and analysis, and receipt of analytical results indicating that the material in the excavation sidewalls and bottom meet the cleanup levels;
    - Survey of the completed limits of the remedial excavation by a Washington state-licensed land surveyor provided by the Contractor. The Contractor shall coordinate for performance of a survey of the horizontal and vertical limits of the excavated areas so that the survey is completed coincident with completion of excavation activities. The Contractor shall coordinate with the survey crew so that the excavation limits can be surveyed as the excavations progress and are completed.
- Material that is removed from each remedial excavation area shall be temporarily stockpiled on site for disposal characterization and shall be contained in separate, stockpiled materials management areas in accordance with the specification in Section 10.2.

The unit price for work performed for Remedial Excavation will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for Remedial Excavation will be measured on a per ton unit basis at the unit price shown on the bid form. Measurement for the per ton item of Remedial Excavation will be based on the original weight tickets provided by the disposal facilities receiving the excavated material. The weights for measurement of the per ton item of Remedial Excavation will be from certified commercial scales. The estimated quantity of soil to be excavated as part of Remedial Excavation is 350 tons. The actual quantity of soil that is excavated may be more or less than the estimated quantity. The Contractor shall be paid based on the actual quantity of excavated tonnage at the unit price shown on the bid form.

Measurement and payment for the work to load, transport, and dispose of material generated as part of Remedial Excavation is described in Section 14.

12.2. Remedial Excavation Verification Sampling and Analysis

Remedial excavation verification sampling will be performed by the Engineer with assistance, as necessary, from the Contractor. Remedial excavation verification sampling will involve collecting soil samples from the base and sidewalls of the remedial excavations after visual observations indicate that contaminated soil has been removed from the excavations to verify that the Site cleanup levels have been achieved. If a sample collected from an excavation sidewall or from the base of the excavation contains contaminant concentrations greater than the Site cleanup levels, additional excavation will be performed to remove soil with contaminant concentrations greater than the cleanup levels and additional verification samples will be collected from the excavation sidewall and base, as appropriate, to confirm the completeness of the contamination removal. Discrete verification samples will be collected by the Engineer from the limits of the remedial excavations at the sampling frequency described in CMP provided in Attachment 4.

The Contractor shall be prepared to coordinate with the Engineer to complete remedial excavation verification sampling and analysis to remove soil with contaminant concentrations greater than

Site cleanup levels. The Engineer shall perform sampling and analysis of the soil in accordance with the sampling and frequency requirements of the CMP (Attachment 4). The Contractor is notified that analysis of the soil samples will take up to 7 days to complete. No additional payment or claims of delay or other damages shall arise based on coordination to complete remedial excavation, verification sampling and analysis.

The cost for analysis of verification samples collected from the remedial excavations shall be paid for from the Laboratory Analysis Allowance bid item. Laboratory invoices for analyses on verification samples shall be submitted by the Contractor for measurement and payment. A markup of 10 percent will be assessed by the Contractor for laboratory analyses.

12.3. Backfilling and Compaction of Remedial Excavation Areas

The Contractor shall backfill the remedial excavation areas to the elevations shown on Sheets C4.0, C4.2, and C4.3 upon completion of remedial excavation activities and approval by the Engineer. Backfill material will be comprised of base course material present at the Site that is removed from beneath the existing access road. Additional imported material may be necessary to complete backfilling the remedial excavation areas. Any imported backfill material shall meet the testing requirements described in the CMP (Attachment 4). The remedial excavations will be backfilled as follows:

- The Contractor shall place backfill material into a remedial excavation only after receiving the Engineer's approval.
- Backfill material will be comprised of base course material present at the Site that is removed from beneath the existing access road unless geotechnical considerations require use of quarry spalls or ballast material or there is not an adequate quantity of base course material removed from beneath the existing access road to complete the backfill.
- The Engineer must approve any imported backfill material source(s) based on source inspections and chemical and physical testing. If the Contractor places the backfill without the Engineer's approval, the Contractor shall remove the remedial excavation backfill material from the Site and dispose of the material off site at a permitted off-site facility at the Contractor's expense.
- The Contractor shall identify all sources of imported backfill material anticipated to be used on the Project in the pre-construction meeting. The Contractor shall also provide at the pre-construction meeting, the results of grain-size distribution (ASTM D 422) and modified Proctor (ASTM D 1557) tests on the proposed imported remedial excavation backfill material from the identified sources. The Engineer shall perform an inspection of the remedial excavation backfill material sources and collect samples to chemically characterize backfill material. The backfill material samples collected by the Engineer will be submitted for chemical analyses in accordance with the CMP (Attachment 4) to demonstrate that the backfill is free from contamination. The results of the chemical analyses will be reviewed by the Engineer to determine whether the backfill material meets the MTCA unrestricted land use criteria. Chemical analysis of the remedial excavation backfill shall be performed on the material prior to the Contractor importing the material to the Site.

- The Engineer shall notify the Contractor of the results of review of physical and chemical analyses. If the proposed imported remedial excavation backfill is not free from contamination or grain-size or modified Proctor tests do not meet the requirements described in the Contract Documents, the Contractor shall propose a new source of backfill material and provide grain-size and modified Proctor tests for the proposed remedial excavation backfill material. The Engineer will be required to perform an inspection of any additional remedial excavation backfill material sources not previously identified and collect samples to chemically characterize the backfill material. No increase in the unit rate will be afforded to the Contractor based on the Contractor's source(s) not meeting the requirements of the project Contract Documents.
- The Contractor shall backfill REA 1 and REA 2 to the lines and grades as indicated on Sheets C4.0, C4.2, and C4.3, with the following backfill materials, where appropriate;
    - Where the base of the remedial excavation is determined to be in a firm and unyielding condition by the Engineer and the base of the excavation is above the groundwater surface, place base course material present at the Site that is removed from beneath the existing access road.
    - Where the base of the remedial excavation is determined to be unsuitably soft by the Engineer, place quarry spalls to stabilize the remedial excavation base for placement of backfill material comprised of gravel base course material removed from beneath the asphalt access road, ballast material and/or bank run gravel. Quarry spalls shall meet the following requirements for grading: Sieve Size Percent Passing 8-inch – 100 percent; 3-inch – 40 percent maximum; ¾-inch – 10 percent maximum.
    - Where the remedial excavation has advanced to an elevation that is below the groundwater surface and/or in areas not suitable for structural fill placement as determined by the Engineer, place ballast material from below the groundwater table to 1 foot above the groundwater table at the time of material placement, as determined by the Engineer. Ballast material shall consist of crushed, partially crushed or naturally occurring granular material in accordance WSDOT Standard Specification 9 03.9(1).
    - Utilize bank run gravel material as a replacement for base course material present at the Site that is removed from beneath the existing access road if there is not an adequate quantity of existing base course material to complete backfill of the remedial excavation(s). The bank run gravel material shall meet the following requirements: 100 percent of the material passing a 4-inch opening and shall not have greater than 6 percent by weight passing a U.S. No. 200 standard sieve (WSDOT Specification 9003.14). The material shall be free of various types of wood waste or other extraneous or objectionable materials.
- Place the remedial excavation backfill materials in maximum loose lifts of 1 foot and compact to at least 95 percent maximum dry density (MDD) as determined by ASTM D 1557. The Engineer will observe backfill operations so that the backfill meets the requirements in these Contract Documents. Field density testing shall be completed by the Engineer at a frequency determined by the Engineer.
- Perform general Site grading such that the finished surface of the remedial excavation backfill material matches the existing ground elevations at the excavation limits.

- Prevent the generation of dust or loss of materials during remedial excavation backfilling and grading and provide dust control, as necessary.
- Coordinate with survey crews to record the final surface elevation of completed remedial excavation backfilling and grading.

The unit cost for Backfill and Compaction of Remedial Excavation Areas using the gravel base course material from beneath the existing access roadway shall include all labor, equipment, handling, placement, and compaction as described in this section. Payment for Backfill and Compaction of Remedial Excavation Areas using the gravel base course material from beneath the existing access roadway will be measured on the basis of the surveyed quantity (i.e., cubic yards) placed in the remedial excavations. The Contractor shall survey the remedial excavation prior to placement of the gravel base course material and upon completion of backfilling with the gravel base course. The actual quantity of gravel base course material that has been placed will be determined upon comparison of the two surveys. The Contractor will supply the results of the two surveys for project tracking purposes. Failure to supply the surveys will result in holding monthly progress payment in lieu of compliance. The estimated quantity of gravel base course material from beneath the existing access roadway that is to be used as backfill for remedial excavations is 233 cubic yards. The actual quantity of gravel base course material used as backfill may be more or less than the estimated quantity. The Contractor shall be paid based on the actual quantity in cubic yards of gravel base course material used as backfill at the unit price shown on the bid form.

The unit cost for Backfill and Compaction of Remedial Excavation Areas for each imported remedial excavation backfill material shall include all labor, equipment, delivery, handling, placement and compaction. Payment for Remedial Excavation for each imported remedial excavation backfill material will be measured on a per ton unit basis at the unit price shown on the bid form. Measurement for the per ton item of Backfill and Compaction of Remedial Excavation Areas for each imported remedial excavation backfill material will be based on the original weight tickets provided by the backfill material supplier. The weights for measurement of the per ton item will be from certified commercial scales. The Contractor will supply the import material load weight tickets upon delivery for project tracking purposes. Failure to supply import load tickets will result in holding monthly progress payment in lieu of compliance. The estimated quantities of imported backfill material for remedial excavation areas are the following:

- 25 tons of quarry spalls
- 25 tons of ballast
- 25 tons of bank run gravel

The actual quantities of imported backfill material for remedial excavation backfill and compaction may be more or less than the estimated quantities. The Contractor shall be paid based on the actual tonnage of each material at the unit prices shown on the bid form.

The cost for analysis of imported backfill samples shall be paid for from the Laboratory Analysis Allowance bid item. Laboratory invoices for analyses on imported backfill samples shall be submitted by the Contractor for measurement and payment. A markup of 10 percent will be assessed by the Contractor for laboratory analyses.

13.0 UTILITY CORRIDOR EXCAVATION AND BACKFILL

Excavation of utility corridors shall be performed in three areas to allow installation and maintenance of utilities. The three utility corridor areas are designated UCA 1, UCA 2, and UCA 3 for the purposes of these contract documents. Material will be excavated from the three utility corridor areas at the Site as shown on Sheet C3.0. Excavation at UCA 1, UCA 2, and UCA 3 is estimated to include removal of approximately 50 in-place tons of material. The actual quantities of excavated material to be removed from UCA 1, UCA 2, and UCA 3 may be greater or less than estimated based on the soil conditions at the excavation limits.

The Contractor shall excavate, line the excavation with geotextile fabric, and backfill UCA 1 to the limits shown on Sheet C3.0. The Contractor shall excavate and line the excavations at UCA 2 and UCA 3 with geotextile fabric to the limits shown on Sheet C3.0. The Contractor shall install stormwater drainage systems and backfill UCA 2 and UCA 3 as shown on Sheets C3.0, C4.5, and C4.6 and in accordance with the specifications provided in Attachment 11. The Contractor shall survey the horizontal and vertical limits of each excavation prior to placement of the geotextile fabric and backfill of the excavations after receiving approval from the Engineer.

The following sections include the method and procedures for excavation of the utility corridors, placement of geotextile fabric, construction of stormwater drainage system, and backfilling and compaction of backfill materials.

13.1. Utility Corridor Excavation

The Contractor shall perform the utility corridor excavations using commonly available excavation methods. The Contractor's excavation procedures shall include the following:

- The Contractor shall locate all utilities present within the utility corridor excavation areas prior to any work that could damage existing Site utilities. The Contractor is responsible for field-locating all existing utilities and shall use all appropriate methods to locate utilities present at the utility corridor excavation areas. Such methods may include, but are not limited to, subcontracting for utility locating services and potholing using safe-dig techniques (i.e., use of an air knife) prior to beginning work.
- Any utilities in the vicinity of the utility corridor excavation areas will be protected, decommissioned, and/or temporarily disconnected and rerouted, as necessary, by the Contractor prior to and/or during excavation activities. Any utilities rerouting and/or restoration shall be performed during and/or after completion of backfilling and restoration at the expense of the Contractor. The Contractor will be responsible for notifying the appropriate agencies at least seven days prior to conducting excavation activities in the immediate vicinity of utilities and shall be responsible for obtaining all necessary inspections and approvals for utility protection, removal, rerouting, and restoration.
- The Contractor shall complete Site clearing and grubbing and demolition in the utility corridor excavation areas, including, but not limited to, demolition of the asphalt pavement access road and removal of the gravel base course prior to initiation of utility corridor excavation.
- The Contractor shall excavate UCA 1 after excavation and backfill of REA 1. Backfill used in REA 1 may be reused as backfill in UCA 1.

- The Contractor shall stake the utility corridor boundaries shown on Sheet C3.0 prior to excavation activities and protect and preserve the survey stakes during the work.
- The Contractor shall initially excavate materials from UCA 1, UCA 2, and UCA 3 to the horizontal limits shown on Sheet C3.0, or as directed by the Engineer, and stockpile the materials from each area separately in stockpile materials management areas. The excavation sidewalls shall not initially be sloped unless required to meet WISHA or OSHA requirements.
- The Contractor shall be solely responsible for excavation slope stability. Excavation work shall be performed in compliance with applicable regulations and in accordance with the Contractor's HASP.
- If necessary, the Contractor shall provide all materials, labor and equipment necessary to shore remedial excavations to protect the work, existing property, utilities, pavement, and any other structures and to provide safe working conditions in the excavation as per WSDOT Standard Specification 7-08.3(1)B and in compliance with applicable local, state or federal safety codes. Shoring plans will be submitted to the Engineer for review before any shoring is installed. Damage resulting from improper shoring or failure to shore shall be the sole responsibility of the Contractor.
- The Contractor shall be aware that the surface and subsurface at the Site consists of fill materials including, but not limited to, soil, concrete, asphalt, wood debris, and other miscellaneous debris.
- Debris may be present in large pieces and/or masses and may include remnant components of previous structures including, but not limited to, concrete foundations, piping, as well as building materials. The Contractor shall provide appropriate equipment for excavating, demolishing, handling, and stockpiling these and other materials. Concrete foundations, footings or other structures present in the utility corridor excavations will be excavated, demolished, and stockpiled with soil and other debris removed from the utility corridor excavation.
- Prevent odors and generation of dust or loss of materials during utility corridor excavation in accordance with the City's ordinance(s) or as directed by the Engineer.
- Prevent cross-contamination of any portion of the Site outside the utility corridor areas. At the determination of the Engineer, the Contractor shall excavate any cross-contaminated material at the Contractor's expense.
- Perform utility corridor excavation in a manner that does not disturb or damage existing structures, utilities, or other facilities not indicated to be removed. Damaged structures, utilities, or other facilities shall be repaired or replaced at the Contractor's expense as determined by the Engineer.
- Support all active utilities adjacent to utility corridor areas, as necessary, during excavation activities to prevent damage to any utility or unsafe working conditions.
- Where excavation of materials in the vicinity of existing active utilities proves to be exceedingly hazardous, utilize safe dig technologies (air knife, vacuum truck potholing, etc.) to the extent practicable.

- Decommission, remove and stockpile any remnant utilities within the limits of the remedial excavations during excavation activities. Any remnant utility pipes shall be plugged at the exposed ends for a distance of 2 diameters with commercial concrete. Care shall be used in placing the concrete in the utility to see that the opening is completely filled and thoroughly plugged.
- Allow and provide safe access to the Engineer for observation during utility corridor excavation work. Excavate additional materials beyond the horizontal and/or vertical limits shown on Sheet C3.0, if visual observations indicate that additional material needs to be removed at the limits of the utility corridor excavations to remove material that may affect future utility construction, operation, and maintenance and stockpile with previously excavated and stockpiled material from the same location. The Contractor shall perform this additional excavation only as directed by the Engineer.
- If water is encountered in a utility corridor excavation, the contractor shall remove, control, contain, and treat the water prior to discharge to the City sanitary sewer system in accordance with the Tacoma Municipal Code and SAD permit requirements and the requirements in Section 10.3.
- The Contractor shall not line the excavation with geotextile fabric or backfill the utility corridor excavation areas until the areas have been approved by the Engineer. Conditions to be achieved for approval include, but are not limited to the following;
    - Achieving the total depth and horizontal extent of excavation based on the design depths and extents shown on Sheet C3.0 and visual observation by the Engineer;
    - Survey of the completed limits of the utility corridor excavation by a Washington state-licensed land surveyor provided by the Contractor. The Contractor shall coordinate for performance of a survey of the horizontal and vertical limits of the excavated areas so that the survey is completed coincident with completion of excavation activities. The Contractor shall coordinate with the survey crew so that the excavation limits can be surveyed as the excavations progress and are completed.
- Material that is removed from each utility corridor excavation area shall be temporarily stockpiled on site for disposal characterization and shall be contained in separate, stockpiled materials management areas as specified in Section 10.2.

The unit price for work performed for Utility Corridor Excavation will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for Utility Corridor Excavation will be measured on a per ton unit basis at the unit price shown on the bid form. Measurement for the per ton item of Utility Corridor Excavation will be based on the original weight tickets provided by the disposal facilities receiving the excavated material. The weights for measurement of the per ton item of Utility Corridor Excavation will from commercial scales. The estimated quantity of soil to be excavated as part of Utility Corridor excavation is 222 tons. The actual quantity of soil that is excavated may be more or less than the estimated quantity. The Contractor shall be paid based on the actual quantity of excavated tonnage at the unit price shown on the bid form.

Measurement and payment for the work to load, transport, and dispose of material generated as part of Utility Corridor Excavation is described in Section 14.

13.2. Geotextile Installation for Utility Corridor Demarcation

The Contractor shall install a geotextile to provide separation between the utility corridor post-excavation surfaces and the backfill placed in the utility corridor excavations. The Contractor shall install construction geotextile fabric within the utility corridor excavation limits for separation as specified in this section and in Section 9-33 of the 2008 WSDOT GSP. Geotextile material shall meet the requirement of Table 3, Separation/Nonwoven category of Section 9-33.

The Contractor's geotextile installation procedures will include, but are not limited to, the following:

- Preparing the utility corridor excavation surface to receive the geotextile fabric material. Preparation for installing the geotextile will include filling any voids, depressions or areas of settlement, determining that the excavated surface of the utility corridor is firm and unyielding and inspecting the excavation surfaces to ensure that the surfaces are smooth and that no sharp protrusions or other features that could damage or affect placement of the geotextile material are present.
- Placing the geotextile material directly over the excavated surfaces at the limits of the utility corridor excavations. The geotextile material will be used as a demarcation of the limits of excavation for future utility installation and/or maintenance.
- Adjacent lengths of parallel sections of the geotextile material will be joined together using plastic ties to support layout and placement of the geotextile material in the utility corridors. The geotextile will be secured at the limits of the utility corridor excavations using wood or metal stakes prior to placement of backfill material.

Installation of geotextile fabric within the utility corridor excavations will be incidental to backfilling the excavations. No separate measurement or payment will be made for geotextile installation within utility corridor excavations.

13.3. Backfilling and Compaction of UCA 1 Excavation Area

The Contractor shall backfill UCA 1 to the elevations shown on Sheets C4.0, C4.2, and C4.3, upon completion of excavation activities and approval by the Engineer. Backfill material will be comprised of base course material present at the Site that is removed from beneath the existing access road. Additional imported material may be necessary to complete backfilling UCA 1 excavation. Any imported backfill material shall meet the testing requirements described in the CMP (Attachment 4). The utility corridor excavations will be backfilled as follows:

- The Contractor shall place backfill material into the UCA excavation only after receiving the Engineer's approval.
- Backfill material will be comprised of base course material present at the Site that is removed from beneath the existing access road unless geotechnical considerations require use of quarry spalls, ballast, and/or geotextile material or there is not an adequate quantity of base course material removed from beneath the existing access road to complete the backfill.
- The Engineer must approve any imported backfill material source(s) based on source inspections and chemical and physical testing. If the Contractor places the backfill without the Engineer's approval, the Contractor shall remove the utility corridor excavation backfill material

from the Site and dispose of the material off site at a permitted off-site facility at the Contractor's expense.

- The Contractor shall identify all sources of imported backfill material anticipated to be used on the Project in the pre-construction meeting. The Contractor shall also provide at the pre-construction meeting, the results of grain-size distribution (ASTM D 422) and modified Proctor (ASTM D 1557) tests on the proposed imported backfill material from the identified sources. The Engineer shall perform an inspection of the backfill material sources and collect samples to chemically characterize the backfill material. The backfill material samples collected by the Engineer will be submitted for chemical analyses in accordance with the CMP (Attachment 4) to demonstrate that the backfill is free from contamination. The results of the chemical analyses will be reviewed by the Engineer to determine whether the backfill material meets the Model Toxics Cleanup Act (MTCA) unrestricted land use criteria. Chemical analysis of the backfill shall be performed on the material prior to the Contractor importing the material to the Site.
- The Engineer shall notify the Contractor of the results of review of physical and chemical analyses. If the proposed imported backfill is not free from contamination or grain-size or modified Proctor tests do not meet the Contract Documents, the Contractor shall propose a new source of backfill material and provide grain-size and modified Proctor tests for the proposed backfill material. The Engineer will be required to perform an inspection of any additional backfill material sources not previously identified and collect samples to chemically characterize the backfill material. No increase in the unit rate will be afforded to the Contractor based on the Contractor's source(s) not meeting the requirements of the project Contract Documents.
- The Contractor shall backfill UCA 1 to the lines and grades as indicated on Sheets C4.0, C4.2, and C4.3, with the following backfill materials, where appropriate;
    - Where the base of the remedial excavation is determined to be in a firm and unyielding condition by the Engineer and the base of the excavation is above the groundwater surface, place base course material present at the Site that is removed from beneath the existing access road.
    - Where the excavation surface is determined to be unsuitably soft by the Engineer or saturated with water, place quarry spalls, ballast, and/or geotextile to stabilize the excavation surface prior to placement of backfill material. The Contractor shall consult with the Engineer to determine the type of ground improvement to be used. Quarry spalls shall meet the following requirements for grading: Sieve Size Percent Passing 8-inch 100 percent, 3-inch 40 percent maximum, ¾-inch 10 percent maximum. Ballast material shall consist of crushed, partially crushed or naturally occurring granular material in accordance WSDOT Standard Specification 9 03.9(1). Geotextile material shall meet Section 9-33 (9-33.2(1), table 3), Soil Stabilization Geotextile.
    - Utilize bank run gravel material as a replacement for base course material present at the Site that is removed from beneath the existing access road if there is not an adequate quantity of existing base course material to complete backfill of the remedial excavation(s). The bank run gravel material shall meet the following requirements: 100 percent of the material passing a 4-inch opening and shall not have greater than 6 percent by weight passing a U.S. No. 200 standard sieve (WSDOT Specification

9003.14). The material shall be free of various types of wood waste or other extraneous or objectionable materials.

- Place the backfill materials in maximum loose lifts of 1 foot and compact to at least 95 percent maximum dry density (MDD) as determined by ASTM D 1557. The Engineer will observe backfill operations so that the backfill meets the requirements in these Contract Documents. Field density testing shall be completed by the Engineer at a frequency determined by the Engineer.
- Perform general Site grading such that the finished surface of the utility corridor excavation backfill material matches the existing ground elevations at the excavation limits.
- Prevent the generation of dust or loss of materials during utility corridor excavation backfilling and grading and provide dust control, as necessary.
- Coordinate with survey crews to record the final surface elevation of completed utility corridor excavation backfilling and grading.

The unit cost for Backfill and Compaction of UCA 1 Excavation Area using the gravel base course material from beneath the existing access roadway shall include all labor, equipment, handling, placement, and compaction as described in this section. Payment for Backfill and Compaction of UCA 1 Excavation Area using the gravel base course material from beneath the existing access roadway will be measured on the basis of the surveyed quantity (i.e., cubic yards) placed in the UCA 1 Area excavation. The Contractor shall survey the UCA 1 excavation prior to placement of the gravel base course material and upon completion of backfilling with the gravel base course. The actual quantity (i.e., cubic yards) of gravel base course material that has been placed will be determined upon comparison of the two surveys. The Contractor will supply the results of the two surveys for project tracking purposes. Failure to supply the surveys will result in holding monthly progress payment in lieu of compliance. The estimated quantity of gravel base course material from beneath the existing access roadway that is to be used as backfill for UCA 1 excavation area is 25 cubic yards. The actual quantity of gravel base course material used as backfill may be more or less than the estimated quantity. The Contractor shall be paid based on the actual quantity in cubic yards of gravel base course material used as backfill at the unit price shown on the bid form.

The unit cost for Backfill and Compaction of UCA 1 Excavation Area for each imported backfill material shall include all labor, equipment, delivery, handling, placement and compaction. Payment for Backfill and Compaction of UCA 1 Excavation Area for each imported backfill material will be measured on a per ton unit basis at the unit price shown on the bid form. Measurement for the per ton item of Backfill and Compaction of UCA 1 Excavation Area for each imported backfill material will be based on the original weight tickets provided by the backfill material supplier. The weights for measurement of the per ton item will be from certified commercial scales. The Contractor will supply the import material load weight tickets upon delivery for project tracking purposes. Failure to supply import load tickets will result in holding monthly progress payment in lieu of compliance. The estimated quantities of imported backfill material for UCA 1 Excavation Area are the following:

- 25 tons of quarry spalls
- 25 tons of ballast
- 25 tons of bank run gravel

The actual quantities of imported backfill material for UCA 1 Excavation Area backfill and compaction may be more or less than the estimated quantities. The Contractor shall be paid based on the actual tonnage of each material at the unit prices shown on the bid form.

The cost for analysis of imported backfill samples shall be paid for from the Laboratory Analysis Allowance bid item. Laboratory invoices for analyses on imported backfill samples shall be submitted by the Contractor for measurement and payment. A markup of 10 percent will be assessed by the Contractor for laboratory analyses.

13.4. Installation of Stormwater Drainage Systems

The Contractor shall install stormwater drainage systems in UCA 2 and UCA 3. Installation of the stormwater drainage systems will be in accordance with the specifications provided in Attachment 11, and as shown on Sheets C3.0, C4.5, and C4.6.

The unit price for work performed for Installation of Stormwater Drainage Systems will include all labor, equipment, and materials as needed to install stormwater drainage systems in UCA 2 and UCA 3 in accordance with the specifications provided in Attachment 11 and as shown on Sheets C3.0, C4.5, and C4.6. Payment for Installation of Stormwater Drainage Systems will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Installation of Stormwater Drainage Systems will be estimated percent completed.

13.5. Backfill and Compaction of UCA 2 and UCA 3 Excavation Areas

The Contractor shall backfill UCA 2 and UCA 3 in accordance with the specifications in Attachment 11 and as shown on Sheet C3.0 upon completion of excavation activities and approval by the Engineer. The backfill will be comprised of pipe bedding material and base course material present at the Site that is removed from beneath the existing access road. Additional imported material may be necessary to complete backfilling UCA 2 and UCA 3 excavation areas. Any imported backfill material shall meet the testing requirements described in the CMP (Attachment 4). The UCA 2 and UCA 3 excavations will be backfilled as follows:

- The Contractor shall place backfill material into UCA 2 and UCA 3 excavations only after receiving the Engineer's approval.
- Backfill material will be comprised of pipe bedding as specified in Attachment 11 and base course material present at the Site that is removed from beneath the existing access road unless geotechnical considerations require use of quarry spalls, ballast, and/or geotextile material or there is not an adequate quantity of base course material removed from beneath the existing access road to complete the backfill.
- The Engineer must approve any imported backfill material source(s) based on source inspections and chemical and physical testing. If the Contractor places the backfill without the Engineer's approval, the Contractor shall remove the backfill material from the Site and dispose of the material off site at a permitted off-site facility at the Contractor's expense.
- The Contractor shall identify all sources of imported backfill material anticipated to be used on the Project in the pre-construction meeting. The Contractor shall also provide at the pre-construction meeting, the results of grain-size distribution (ASTM D 422) and modified Proctor

(ASTM D 1557) tests on the proposed imported backfill material from the identified sources. The Engineer shall perform an inspection of the backfill material sources and collect samples to chemically characterize the backfill material. The backfill material samples collected by the Engineer will be submitted for chemical analyses in accordance with the CMP (Attachment 4) to demonstrate that the backfill is free from contamination. The results of the chemical analyses will be reviewed by the Engineer to determine whether the backfill material meets the Model Toxics Cleanup Act (MTCA) unrestricted land use criteria. Chemical analysis of the backfill shall be performed on the material prior to the Contractor importing the material to the Site.

- The Engineer shall notify the Contractor of the results of review of physical and chemical analyses. If the proposed imported backfill is not free from contamination or grain-size or modified Proctor tests do not meet the Contract Documents, the Contractor shall propose a new source of backfill material and provide grain-size and modified Proctor tests for the proposed backfill material. The Engineer will be required to perform an inspection of any additional backfill material sources not previously identified and collect samples to chemically characterize the backfill material. No increase in the unit rate will be afforded to the Contractor based on the Contractor's source(s) not meeting the requirements of the project Contract Documents.
- The Contractor shall backfill UCA 2 and UCA 3 to the lines and grades as indicated on Sheets C3.0, C4.2, and C4.3, with the following backfill materials, where appropriate;
    - Where the base of the excavation is determined to be in a firm and unyielding condition by the Engineer and the base of the excavation is above the groundwater surface, pipe bedding material in accordance with the specifications in Attachment 11 and as shown on Sheet C3.0.
    - Where the excavation surface is determined to be unsuitably soft by the Engineer or saturated with water, place quarry spalls, ballast, and/or geotextile to stabilize the excavation surface prior to placement of backfill material. The Contractor shall consult with the Engineer to determine the type of ground improvement to be used. Quarry spalls shall meet the following requirements for grading: Sieve Size Percent Passing 8-inch 100 percent, 3-inch 40 percent maximum, ¾-inch 10 percent maximum. Ballast material shall consist of crushed, partially crushed or naturally occurring granular material in accordance WSDOT Standard Specification 9 03.9(1). Geotextile material shall meet Section 9-33 (9-33.2(1), table 3), Soil Stabilization Geotextile.
    - Utilize gravel base course material from beneath the existing asphalt access roadway for backfill from the top of the pipe bedding to the Site surface.
    - Utilize bank run gravel material as a replacement for base course material present at the Site that is removed from beneath the existing access road if there is not an adequate quantity of existing base course material to complete backfill of the remedial excavation(s). The bank run gravel material shall meet the following requirements: 100 percent of the material passing a 4-inch opening and shall not have greater than 6 percent by weight passing a U.S. No. 200 standard sieve (WSDOT Specification 9003.14). The material shall be free of various types of wood waste or other extraneous or objectionable materials.

- Perform general Site grading such that the finished surface of the backfill material matches the existing ground elevations at the excavation limits.
- Prevent the generation of dust or loss of materials during remedial excavation backfilling and grading and provide dust control, as necessary.
- Coordinate with survey crews to record the final surface elevation of completed backfilling and grading.

The unit cost for Backfill and Compaction of UCA 2 and UCA 3 Excavation Areas for each imported backfill material shall include all labor, equipment, delivery, handling, placement and compaction. Payment for Backfill and Compaction of UCA 2 and UCA 3 Excavation Areas for each imported backfill material will be measured on a per ton unit basis at the unit price shown on the bid form. Measurement for the per ton item of Backfill and Compaction of UCA 2 and UCA 3 Excavation Areas for each imported backfill material will be based on the original weight tickets provided by the backfill material supplier. The weights for measurement of the per ton item will be from certified commercial scales. The Contractor will supply the import material load weight tickets upon delivery for project tracking purposes. Failure to supply import load tickets will result in holding monthly progress payment in lieu of compliance. The estimated quantities of imported backfill material for UCA 2 and UCA 3 Excavation Area are the following:

- 25 tons of quarry spalls
- 25 tons of ballast
- 25 tons of bank run gravel
- 80 tons of pipe bedding

The actual quantities of imported backfill material for UCA 2 and UCA 3 Excavation Areas backfill and compaction may be more or less than the estimated quantities. The Contractor shall be paid based on the actual tonnage of each material at the unit prices shown on the bid form.

The unit cost for Backfill and Compaction of UCA 2 and UCA 3 Excavation Areas using the gravel base course material from beneath the existing access roadway shall include all labor, equipment, handling, placement, and compaction as described in this section. Payment for Backfill and Compaction of UCA 2 and UCA 3 Excavation Area using the gravel base course material from beneath the existing access roadway will be measured on the basis of the surveyed quantity (i.e., cubic yards) placed in the remedial excavations. The Contractor shall survey UCA 2 and UCA 3 excavations prior to placement of the gravel base course material and upon completion of backfilling with the gravel base course. The quantity of gravel base course material that has been placed will be determined upon comparison of the two surveys. The Contractor will supply the results of the two surveys for project tracking purposes. Failure to supply the surveys will result in holding monthly progress payment in lieu of compliance. The estimated quantity of gravel base course material from beneath the existing access roadway that is to be used as backfill for UCA 2 and UCA 3 excavation areas is 25 cubic yards. The actual quantity of gravel base course material used as backfill may be more or less than the estimated quantity. The Contractor shall be paid based on the actual quantity in cubic yards of gravel base course material used as backfill at the unit price shown on the bid form.

The cost for analysis of imported backfill samples shall be paid for from the Laboratory Analysis Allowance bid item. Laboratory invoices for analyses on imported backfill samples shall be submitted by the Contractor for measurement and payment. A markup of 10 percent will be assessed by the Contractor for laboratory analyses.

14.0 MATERIAL MANAGEMENT, LOADING, TRANSPORT, AND DISPOSAL, OR RECYCLING

The Contractor shall manage, load, transport, and dispose of or recycle materials generated as part of the work including the following;

- Vegetation resulting from clearing and grubbing;
- Trash and debris resulting from site preparation and demolition; and
- Soil and debris resulting from remedial excavations; and
- Soil and debris resulting from excavation of utility corridors;

The material generated from the work will be segregated and disposed of or recycled based on the type and source of the material as well as sampling and chemical analysis for some materials. Table 3 summarizes the types and sources of material to be generated as part of the work, the specified methods of material management, and method of disposal or recycling.

Vegetation resulting from clearing and grubbing includes above ground components of brush and trees as well as below ground components comprised of roots and stumps in contact with or containing Site soil. The above ground components of Site vegetation that are removed and segregated from other materials generated as part of the work in accordance with the specifications in Section 11.2 will be loaded and disposed of off site as land clearing debris at a facility approved by the Engineer. No additional payment will provided for transport of light loads.

The component of Site vegetation that is in contact with or contains Site soil removed and stockpiled in a stockpiled materials management area in accordance with the specifications in Section 11.6, will be sampled by the Engineer to characterize the material for off-site disposal and loaded and transported off site by the Contractor to a disposal facility approved by the Engineer based on the results of the material sampling and analysis. The component of Site vegetation that is in contact with or containing Site soil will be disposed of at a Subtitle D or Subtitle C landfill based on the results of material sampling and analysis.

Trash including paper, glass, wood, or other materials typical of municipal solid waste and present at the surface of the Site collected in accordance with the specifications in Section 11.3 will be loaded and disposed of off site as solid waste at a Subtitle D landfill approved by the Engineer. The trash will initially be collected and segregated from other materials generated as part of the work in accordance with the specifications in Section 11.3 but may be transported off site in combination with soil, debris, or other materials characterized as solid waste that is being disposed of at a subtitle D landfill approved by the Engineer.

Trash and debris comprised of metal present at the surface of the Site collected in accordance with the specifications in Section 11.3 will be loaded and recycled at a metal recycling facility approved

by the Engineer. The metal will remain segregated from other materials generated as part of the work and transported separate from other materials generated at the Site to the recycling facility.

Remnant asphalt pavement located in various areas around the Site, excluding asphalt pavement comprising the existing access roadway, will be loaded and transported off site by the Contractor to a Subtitle D landfill approved by the Engineer.

Asphalt pavement comprising the existing access roadway that is segregated from other materials generated as part of the work in accordance with the specifications in Section 11.6, will be loaded and recycled off site at construction debris recycling facility approved by the Engineer. The asphalt pavement comprising the existing access roadway will be managed to minimize contact with Site soil prior to transport off site for recycling.

Soil and debris generated as part of clearing and grubbing, remedial excavations at REA 1 and REA 2, and excavations for utility corridors in UCA 1, UCA 2, and UCA 3 will initially be segregated from each other and other materials generated as part of the work in accordance with the specifications in Sections 12.1 and 13.1 to allow for the individual characterization of material excavated from each area. The material generated during excavation in each area, including any debris removed from each area, that is temporarily placed in stockpiled materials management areas in accordance with the specifications in Sections 12.1 and 13.1, will be sampled by the Engineer to characterize the material for off site disposal, and loaded and transported off site by the Contractor to a disposal facility approved by the Engineer based on the results of the material sampling and analysis. Soil and debris may be transported off site in combination with other soil and debris or other materials of similar characterization that is being disposed of at the same landfill. No additional payment will provided for transport of light loads.

The Engineer will collect samples from each stockpile in accordance with the procedures specified in the CMP (Attachment 4) and submit the samples to a chemical analytical laboratory for analysis. The results from stockpile sampling and analysis will be compared to landfill disposal criteria by the Engineer to identify the appropriate disposal location. The Engineer will transmit the sample results to the landfill for authorization and acceptance of the stockpiled material for disposal. Upon receipt of authorization and acceptance for disposal, the Contractor shall load and transport the stockpiled material to the landfill for disposal and provide the documentation of disposal to the Engineer. Sampling and analysis, comparison of the sample results to landfill criteria, and acceptance of the stockpiled material by the landfill will be performed/obtained prior to loading and transport of any stockpiled material off site for disposal by the Contractor.

Based on the results of the stockpiled material sampling and analysis, the stockpiled material will fall into two categories: (1) non-dangerous, solid waste, suitable for disposal at a Subtitle D landfill or (2) Hazardous/Dangerous waste to be disposed of at a Subtitle C landfill. Based on the existing data, approximately 200 tons is anticipated to be classified as Hazardous/Dangerous waste and will be disposed of at a Subtitle C landfill approved by the Engineer. Soil designated as a Hazardous/Dangerous waste will be managed and transported by the Contractor in accordance with the Washington State Dangerous Waste Regulations (WAC 173-303). It is anticipated that approximately 50 tons will be classified as non-dangerous, solid waste that will be disposed of at a Subtitle D landfill approved by the Engineer.

The Contractor will identify the facilities to be used to dispose of materials generated by the work during the pre-construction meeting. In preparation for the American Plating Site Remediation Project, draft waste profiles have been submitted for disposal of soil and debris to be stockpiled and characterized prior to disposal and preliminary authorizations for disposal have been received from the following Subtitle D and Subtitle C landfills:

- Republic Services Roosevelt Regional Municipal Solid Waste Landfill (Subtitle D) located in Roosevelt, Washington; and
- Chemical Waste Management Landfill (Subtitle C) located in Arlington, Oregon.

The draft waste profiles and preliminary authorizations are provided in Attachment 6.

The Contractor can choose to utilize the landfills for which preliminary authorizations have been received for disposal of soil and debris to be stockpiled and characterized prior to disposal, that are identified above, or can identify different landfill facilities for disposal of the stockpiled material.

If the Contractor identifies a different disposal facility, the facility must be a Subtitle D or Subtitle C Landfill, at a minimum, and it's permitting and operations must meet all federal, state, and local regulations for disposing of waste materials. If the Contractor elects to choose a disposal facility other than the facilities that have provided preliminary waste authorizations as identified in these Contract Documents, any costs incurred by the Contractor to perform testing for waste material acceptance, prepare submittals for waste profiling, waste disposal authorization, or any other approvals, and any other additional costs associated with disposal at the Contractor's selected facility shall be at the Contractor's expense and not borne by the contracting agency. Any facility selected by the Contractor must be approved by the Engineer prior to use.

The Contractor shall perform the following to dispose of the material generated as a result of the work;

- Provide and coordinate all off-site transportation of material identified in these Contract Documents and any additional material as directed by the Engineer to a disposal facility approved by the Engineer.
- Manage and transport material designated Hazardous/Dangerous waste in accordance with Dangerous Waste regulations (Chapter 173-303 WAC).
- Load the material into appropriate containers and/or trucks for transport to the appropriate disposal facility/facilities.
- Wet material will be allowed to drain sufficiently of water prior to loading and transport to the selected disposal facility/facilities so the material meets the disposal requirements of the facility/facilities.
- Prevent the generation of dust or loss of material from containers and/or trucks used for transport the material to prevent contamination of areas outside of the Site. Cover containers and/or trucks prior to leaving the Site to prevent loss of the material during transport. Line containers and/or trucks, if necessary, to prevent loss of excavated material and any free

liquids from transport containers and/or trucks. Any material released by the Contractor outside of the Site shall be cleaned up at the Contractor's sole expense.

- Unload the material at the approved disposal facility.
- Provide original waste manifests, weight tickets, and disposal receipts from the approved disposal facility that identifies the disposal facility, waste material hauler (i.e., company, truck identification, driver, etc.), date of transport, and weight of material transported.

The unit cost for work performed for Material Management, Loading, Transport, Disposal, or Recycling will include all labor, equipment, and materials as needed to manage, load, transport, and dispose of materials, including disposal or recycling fees (i.e., tipping fees), generated as part of the work described in this section. Payment for Material Management, Loading, Transport, Disposal, or Recycling will be measured on a per ton unit basis at the unit prices shown on the bid form. Contractor is notified that material to be disposed of includes wood and other organic material. No additional payment shall be provided for transporting of light loads. Measurement for the per ton item of Material Management, Loading, Transport, Disposal, or Recycling will be based on the original weight tickets provided by the disposal facilities receiving the material. The weights for measurement of the per ton item of Material Management, Loading, Transport, Disposal, or Recycling will from certified commercial scales. Original disposal weight tickets will be supplied to the Engineer two days after material disposal for project tracking purposes and monthly progress payment evaluation. Monthly progress payments will be held in lieu of Engineer receiving disposal weight tickets for payment period. The estimated quantities of materials requiring loading, transport, disposal, or recycling are the following:

- 40 tons of land clearing debris
- 360 tons of Subtitle D landfill material
- 350 tons of Subtitle C landfill material
- 210 tons of asphalt construction debris
- 1 ton of metal trash and debris

The actual quantity of material requiring loading, transport, disposal, or recycling may be more or less than the estimated quantity. The Contractor shall be paid based on the actual tonnage of each material at the unit prices shown on the bid form.

The cost for analysis of stockpiled material samples shall be paid for from the Laboratory Analysis Allowance bid item. Laboratory invoices for analyses on stockpiled material samples shall be submitted by the Contractor for measurement and payment. A markup of 10 percent will be assessed by the Contractor for laboratory analyses.

15.0 SITE GRADING AND CAPPING

The Contractor shall perform Site grading and capping upon completion of Site work that includes, but is not limited to, Site preparation, clearing and grubbing, demolition, remedial excavation, and utility corridor excavation. Site grading and capping will be performed in accordance with the specifications presented in this section and as shown on Sheets C4.0 through C4.4. The Contractor shall coordinate, phase, and schedule Site grading and capping work to meet or exceed

the project schedule. No additional payment or claims of delay or other damages shall arise based on coordination, phasing, or scheduling of Site grading and capping work.

The Contractor shall perform Site grading and capping using commonly available methods. It is anticipated that Site grading and capping will be phased upon the completion of Site preparation, clearing and grubbing, demolition, remedial excavation and utility corridor excavation within a given area.

Site soil will be re-graded to meet the elevations shown on Sheets C4.0 through C4.4. All soil within the project boundary will be capped with either three feet of fill/soil or 16 inches of fill/soil and asphalt upon completion of Site grading. The area of each cap type that will be placed at the Site is shown on Sheet C4.0. Sheet C4.1 provides the details for each cap type.

A portion of the habitat area in the northwesterly area of the Site is proposed to be improved with gravel surface. The gravel area will serve as a public access path until the Site is fully converted to a park. The use of the gravel surfacing is considered a temporary improvement inasmuch as this area will be redeveloped as a continuation of the esplanade upon construction of Foss Waterway Park. Mitigation plantings within the habitat area will be provided, if necessary, as part of the Foss Waterway Park design.

Fill/soil capping material will be protected each day using erosion control measures (i.e., plastic sheeting, etc.), as necessary, to prevent generation of dust, loss of material, or transport of capping material off site in stormwater.

The Contractor's grading and capping procedures shall include the following:

- The Contractor shall grade the Site as shown on Sheets C4.0 through C4.4.
- Excavation of soil at the boundaries of the Site to allow placement of the full cap thickness up to the boundaries of the Site as well as transition the completed cap surface elevation to the existing elevations of adjacent properties.
- Re-grading and compaction of the excavated Site soil, as necessary, to establish the pre-capping Site elevations as well as establish Site drainage.
- Excavation/re-grading of Site soil to complete the placement of caps of different thicknesses adjacent to each other.
- Incorporation and re-grading of concrete resulting from demolition of concrete surfacing, foundations, footings, and other structures to establish the pre-capping Site elevations as well as establish Site drainage.
- The Contractor shall complete all Site Work, excluding Site restoration work, prior to performing capping to avoid disturbance or penetration into the completed caps.
- The Contractor shall perform a pre-capping, baseline survey in all areas where Site grading has been completed prior to placing capping material. If Site grading and capping are phased by area, the Contractor's survey shall be performed so that individual surveyed areas can be combined to provide one baseline survey for the entire Site. The Contractor will provide the baseline survey to the Engineer to provide the baseline for assessing the completed cap

thicknesses at the Site. The Contractor will perform the baseline survey in a given area only after receiving approval from the Engineer that Site grading is complete. The Contractor will perform capping in a given area only after performing the baseline survey.

- The Contractor shall incorporate the existing soil stockpile located on the Site into capping material placed on the western portion of the Site where the cap surface will be vegetated. The volume of the existing soil stockpile is estimated to be approximately 540 cubic yards. The existing, stockpiled soil will be placed and compacted as the first one-foot of capping material on the western portion of the Site as shown on Sheets C4.0 through C4.4. Information for the existing stockpiled soil is provided in Attachment 12.
- The Contractor shall use imported fill/soil capping materials for the remaining Site capping that have been inspected by the Engineer; that have been sampled, chemically analyzed, and meet MTCA unrestricted land use criteria; and that have been approved by the Engineer.
- The Contractor shall identify all sources of capping material in the pre-construction meeting. The Contractor shall also provide at the pre-construction meeting the results of grain-size distribution (ASTM D 422) and modified Proctor (ASTM D 1557) tests on the proposed capping material from the identified sources. The Engineer shall perform an inspection of the capping material sources and collect samples to chemically characterize the capping material. The Engineer will complete chemical testing on capping material in accordance with CMP (Attachment 4) to demonstrate that the backfill is free from contamination and review the chemical analytical data to determine whether the capping material meets MTCA unrestricted land use criteria. The chemical testing on capping material shall be performed prior to the Contractor importing the material to the Site.
- The Engineer shall notify the Contractor of the results of review of physical and chemical analyses. If the proposed capping material is not free from contamination or grain-size or modified Proctor tests do not meet the Contract Documents, the Contractor shall propose a new source of capping material and provide grain-size and modified Proctor tests for the proposed backfill material. No increase in the unit rate will be afforded to the Contractor based on the Contractor's source(s) not meeting the project Contract Documents. The Engineer will perform additional, inspection, sampling and analysis of the capping material to chemically or physically characterize the capping material.
- The Contractor shall place capping material in accordance with the specifications in this section and as shown on Sheets C4.0 through C4.4 only after receiving approval from the Engineer that all preparatory Site work has been completed including Site grading and performance of the pre-capping survey. The Contractor must also have the approval from the Engineer for the capping material source(s). If the Contractor places capping material without the approval of the Engineer, the Contractor shall remove the capping material from the Site and dispose of the material off site at a Subtitle D Landfill at the Contractor's expense.
- The Contractor shall place capping material to the lines and grades as indicated on Sheets C4.0 through C4.4, with the following capping materials, where appropriate;
    - Where the re-graded Site surface is determined to be unsuitably soft by the Engineer or saturated with water, place quarry spalls, ballast, and/or geotextile to stabilize the Site

surface prior to placement of capping material as indicated on Sheets C4.0 through C4.4. The Contractor shall consult with the Engineer to determine the type of ground improvement to be used. Quarry spalls shall meet the following requirements for grading: Sieve Size Percent Passing 8-inch 100 percent, 3-inch 40 percent maximum, ¾-inch 10 percent maximum. Ballast material shall consist of crushed, partially crushed or naturally occurring granular material in accordance WSDOT Standard Specification 9 03.9(1). Geotextile material shall meet Section 9-33 (9-33.2(1), table 3), Soil Stabilization Geotextile.

- The bank run gravel material shall meet the following requirements: 100 percent of the material passing a 4-inch opening and shall not have greater than 6 percent by weight passing a U.S. No. 200 standard sieve (WSDOT Specification 9003.14). The material shall be free of various types of wood waste or other extraneous or objectionable materials.
- The crushed surfacing base course shall meet the following requirements: 1-1/4 inch minus base course. Base course materials shall meet WSDOT Standard Specification 9-03.9(3) for crushed surfacing.
- The crushed surfacing top course shall meet the following requirements: 3/8 inch minus top course. Top course materials shall meet WSDOT Standard Specification 9-03.9(3) for crushed surfacing.
- Topsoil shall meet the following requirements: Topsoil material shall consist of material free of various types of wood waste or other extraneous or objectionable materials. It may consist of a combination of imported soil and organic materials that have been amended on or off Site. One hundred percent of the material shall pass a 2-1/2-inch opening. The topsoil capping material shall have 12 to 15 percent fines passing a U.S. No. 200 standard sieve.
- Asphalt shall meet the following requirements: The asphalt pavement section shall be hot mix asphalt HMA CL ½ inch PG 6422. Mix design shall be based on this 3-inch pavement section and 3 million Equivalent Single Axle Loads (ESALs). Hot mix asphalt shall be compacted to 92 percent of the maximum density as determined by American Association of State Highway and Transportation Officials (AASHTO) T 209. All hot mix asphalt utilized shall be considered compactable. The level of compaction attained will be determined as the average of not less than five nuclear density gauge tests taken on the day the mix is placed at randomly selected locations within each lot as determined by the Engineer.

- The Contractor shall be prepared to place and compact capping materials to finish grades each work day. Capping will be phased in such a way that it can be completed concurrently with other project work and will be protected each day with erosion control measures, including covering with plastic sheeting and routing all water to the water collection and treatment system, that prevent discharges from the Site.
- Prevent cross-contamination and/or re-contamination of capped areas. At the determination of the Engineer, the Contractor shall excavate any cross-contaminated and/or re-contaminated material at the Contractor's expense.
- The Contractor shall place capping materials in maximum loose lifts of 1 foot and compact to at least 95 percent maximum dry density (MDD) as determined by ASTM D 1557 except for topsoil. Topsoil should be static rolled with a smooth drum roller. The Engineer will observe

capping operations so that the material meets the requirements in these Contract Documents. Field density testing shall be completed by the Engineer and at a frequency determined by the Engineer.

- The Contractor shall complete all Site capping and final Site grading of the capped surfaces so that the cap meets the cap thickness requirements at a minimum and so that the Site grading and drainage is completed in accordance with the project plans as shown on sheets C4.0 through C4.4 unless otherwise approved by the Engineer. No additional payment will be provided for all labor, equipment, and materials expended by the Contractor to place capping material greater than the minimum cap thickness requirements. The component of capped surfaces that are greater than 0.1 foot above the required cap thickness will be at the Contractor's expense. The finished surface of the capping material shall also be graded to match the surrounding ground elevations at the Site limits.
- Capping material shall be placed along the western Site boundary, which is the OHW line, but shall not be placed beyond the western Site boundary below the OHW line. Site work including, but not limited to, grading and capping adjacent to and up to the OHW line shall be performed in consideration of and account for fluctuations in the tidal elevation of surface water in the Thea Foss Waterway as well as consideration of storm events that may affect adjacent surface water elevations and any associated affects of such changes. The Contractor shall phase and schedule all Site work, including but not limited to, Site grading and capping adjacent to and up to the OHW line so that Site work shall not affect the area beyond the western Site boundary below the OHW line and surface water in the Thea Foss Waterway. Any effects, impacts, and damages to the area beyond the western Site boundary below OHW and/or surface water in the Thea Foss Waterway resulting from the Contractor's operations or work and any associated penalties, fines, or other monetary costs resulting from the effects, impacts, and damages shall be borne by the Contractor.
- Where asphaltic pavement and concrete sidewalk/pavement areas are to be repaired or replaced, the Contractor shall prepare the subgrade conditions in accordance with the City's standard drawings and notes. The gravel shall meet WSDOT Specification 9-03.10 requirements.
- Perform grading of Site capping material such that finished cap surfaces are within 0.1 feet above the required elevations shown on the Plans unless otherwise approved by the Engineer. The finished surface of the capping material shall also be graded to match the surrounding ground elevations at the Site limits.
- Prevent the generation of dust or loss of materials during capping. Provide dust control as necessary.
- The Contractor shall perform and provide to the Engineer a post-cap, as built survey to record the final surface elevation of completed capping and grading.

The unit cost for work performed for Site Grading will include all labor, equipment, and materials as needed to excavate, re-grade, and compact material and to perform the pre-capping survey to complete the work described in this section. Payment for Site Grading will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Site Grading will be based on the estimated percent completed.

The unit cost for work performed for Site Capping using the existing soil stockpile located on the Site into capping materials placed on the western portion of the Site will include all labor, equipment, and materials as needed to relocate, grade, and compact material to complete the work described in this section. Payment for using the existing soil stockpile located on the Site will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Site Capping using the existing soil stockpile located on the Site will be based on the estimated percent completed.

The unit cost for Site Capping for each imported capping material shall include all labor, equipment, and materials and imported capping material delivery, handling, placement and compaction and to perform the post-capping, as-built survey. Payment for Site Capping for each imported capping material will be measured on a per ton unit basis at the unit prices shown in the bid form. Measurement for the per ton item of Site Capping for each imported capping material will be based on the original weight tickets provided by the capping material supplier. The weights for measurement of the per ton item will be from certified commercial scales. The Contractor will supply the import material load weight tickets upon delivery for project tracking purposes. Failure to supply import load weight tickets will result in holding monthly progress payment in lieu of compliance. The estimated quantities of imported capping material for Site capping are the following:

- 35 tons of quarry spalls
- 35 tons of ballast
- 2,570 tons of bank run gravel
- 1,000 tons of crushed surfacing base course
- 695 tons of crushed surfacing top course
- 930 tons of top soil

The actual quantities of imported capping material for Site capping and compaction may be more or less than the estimated quantities. The Contractor shall be paid based on the actual tonnage of each material at the unit prices shown on the bid form.

The cost for analysis of imported capping material samples shall be paid for from the Laboratory Analysis Allowance bid item. Laboratory invoices for analyses on imported capping material samples shall be submitted by the Contractor for measurement and payment. A markup of 10 percent will be assessed by the Contractor for laboratory analyses.

The unit cost for Site Capping with Asphalt Pavement shall include all labor, equipment, and materials and pavement capping material delivery, handling, placement and compaction and to perform the post-capping, as-built survey. Payment for Asphalt Pavement Capping will be measured on a square foot unit basis at the unit price shown on the bid form. Measurement for the square foot item of Site Capping for Asphalt Pavement will be based on survey measurement of completed asphalt pavement at the Site. The estimated quantity of asphalt pavement is 21,000 square feet. The actual quantity of asphalt pavement capping that is installed may be more or less than the estimated quantity. The Contractor shall be paid based on the actual quantity of asphalt pavement in square feet at the unit price shown on the bid form.

16.0 SITE RESTORATION

The Contractor shall perform Site restoration work following the completion of Site capping. Site restoration work shall be performed in accordance with the requirements of this section and as shown on Sheets C5.0 through C5.2.

The Contractor shall maintain all temporary erosion and sediment control facilities, including the water collection and treatment system, until the Site has been fully stabilized and the Site restoration has been accepted by the Engineer and Owner. The Contractor shall be aware that the restoration landscaping components will require specific planting maintenance and a planting warranty period.

Any damages to property and structures including, but not limited to, adjacent property, utilities, driveways, sidewalks, pavement buildings, landscaping, vehicles or City ROWs caused by the Contractor during the work, will be restored at the Contractor's expense during Site restoration. The Contractor shall prevent cross-contamination and/or re-contamination of capped areas during Site restoration activities. At the determination of the Engineer, the Contractor shall excavate any cross-contaminated and/or re-contaminated material at the Contractor's expense.

16.1. City ROW and Utilities Restoration

The Contractor shall restore all utilities, structures, and surfaces within the City of Tacoma ROW that are removed or rerouted to complete utility corridor excavation and installation of the stormwater management system at UCA 3. The Contractor shall restore all utilities, structures and surfaces in accordance with the City of Tacoma ROW Restoration Policy (adopted June 2, 2009) and the City of Tacoma Municipal Code, Volumes I and II and as shown on Sheet C5.2. The Contractor will be responsible for notifying the appropriate agencies at least seven days prior to conducting excavation activities in the immediate vicinity of the City of Tacoma ROW and utilities and shall be responsible for obtaining all necessary inspections and approvals for utility, structure, and surfaces removal, rerouting, and restoration.

The unit cost for work performed for City ROW and Utilities Restoration will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for City ROW and Utilities Restoration will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of City ROW and Utilities Restoration will be estimated percent completed.

16.2. Habitat Enhancement Area Restoration

The western Project boundary lies within a habitat enhancement area constructed as part of the Thea Foss Waterway Remediation Project. The Contractor shall install plants in the habitat enhancement area shown on Sheet C-5 to restore habitat enhancement plantings in accordance with the planting details shown on Sheet C-5.1.

The restoration planting layout, schedule for planting, and maintenance requirements of the completed plantings are presented on Sheet C5.1. Extreme care shall be taken during restoration work at and adjacent to the western Project boundary. The Contractor shall phase and schedule all Site work, including but not limited to, restoration planting adjacent to and up to the OHW line in

the habitat enhancement area so that Site work shall not affect the area beyond the western Site boundary below OHW and surface water in the Thea Foss Waterway. Any effects, impacts, and damages to the area beyond the western Site boundary below OHW and/or surface water in the Thea Foss Waterway resulting from the Contractor's operations or work and any associated penalties, fines, or other monetary costs resulting from the effects, impacts, and damages shall be borne by the Contractor.

The unit cost for work performed for Habitat Enhancement Area Restoration will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for Habitat Enhancement Area Restoration will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Habitat Enhancement Area Restoration will be estimated percent completed.

16.3. Groundwater Monitoring Well Installation

The Contractor shall install new, replacement monitoring wells at the locations shown on Sheets C5.0 and C5.2. Drilling and construction of the monitoring wells will be performed by a Washington State licensed driller in accordance with the Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC) and observed by a licensed geologist. The monitoring well borings will be drilled using a hollow-stem auger drill rig. The monitoring wells are to be installed to depths between approximately 15 and 20 feet bgs. The Engineer will provide a licensed geologist to monitor and log the borings and well installation. Soil cuttings from the borings completed for installation of the monitoring wells will be placed in labeled and sealed 55 gallon drums. The drums will be stored temporarily at a secure location on the Site pending off-site disposal at a permitted disposal facility approved by the Engineer.

The monitoring wells will be constructed of 2-inch-diameter, flush-threaded, schedule 40 polyvinyl chloride (PVC) casing with machine-slotted PVC screen (0.010-inch). The screened interval will be 5-feet in length. A filter pack will be installed around the well screen from the bottom of the well to 1 foot above the top of the well screen. The filter pack material will consist of commercially prepared 10-20 silica sand. A bentonite annular seal will be placed above the sand pack to a depth of approximately 1 foot bgs. Each well will be completed with a concrete surface seal and a flush-mount monument. The monument will be cemented in place from the surface to a depth of approximately 1 foot bgs.

The unit cost for work performed for Groundwater Monitoring Well Installation will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for Groundwater Monitoring Well Installation will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Groundwater Monitoring Well Installation will be estimated percent completed.

16.4. New Tree Installation

The Contractor shall install a new deciduous tree in the location shown on Sheet C5.0. The tree shall be installed in as shown on Sheet C5.1. The depth of tree installation shall be limited to the depth of Site capping materials. Site soil beneath the cap shall not be disturbed or removed during tree installation activities.

The unit cost for work performed for New Tree Installation will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for New Tree Installation will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of New Tree Installation will be estimated percent completed.

16.5. Vegetated Surface Area Restoration

The capped areas on the western and northern portions of the Site that are to be completed with a vegetated surface will be hydroseeded. The areas to be hydroseeded are shown on Sheet C5.0. The Contractor shall apply hydroseed to the capped areas in accordance with the specifications provided on Sheet C5.0. Preparation of the topsoil and hydroseeding of the areas shall be in accordance with WSDOT standard specifications 8-01.3(2) and 9-14.2.

The unit cost for work performed for Vegetated Surface Area Restoration will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for Vegetated Surface Area Restoration will be measured on a square foot unit basis at the unit price shown on the bid form. Measurement for the square foot item of Vegetated Surface Area Restoration will be based on survey measurement of completed vegetated surface area restoration at the Site. The estimated quantity of vegetated surface area is 15,800 square feet. The actual quantity of vegetated surface area restoration that is installed may be more or less than the estimated quantity. The Contractor shall be paid based on the actual quantity of vegetated surface area restoration in square feet at the unit price shown on the bid form.

16.6. Fencing Restoration

The Contractor shall, to the extent practicable, restore Site fencing using existing chain-link fencing, gate materials, and hardware that were removed and salvaged during Site preparation activities. The Contractor shall reinstall Site fencing in the locations shown on Sheet C5.0 in accordance with the details shown on Sheet C5.2. New fence posts will be used to reinstall Site fencing as well as new chain-link fencing, gate materials, and hardware if existing chain-link fencing, gate materials, and hardware have been exhausted during installation or if portions of the chain-link fencing and gate materials are deficient and not able to be reused. Site soil beneath the cap shall not be disturbed or removed during fence post installation activities.

The unit cost for work performed for Fencing Restoration will include all labor, equipment, and materials as needed to complete the work described in this section. Payment for Fencing Restoration will be measured on a lump sum unit basis at the unit price shown on the bid form. Measurement for the lump sum item of Fencing Restoration will be estimated percent completed.

17.0 COMPLIANCE MONITORING

Compliance monitoring will be implemented in accordance with WAC 173-340-410 and the CMP provided in Attachment 4. The three types of compliance monitoring to be performed include:

- Protection Monitoring to confirm that human health and the environment are adequately protected during the work performed as part of the American Plating Site Remediation Project.
- Performance Monitoring to confirm that the work has attained cleanup standards.

- Confirmational Monitoring to confirm the long-term effectiveness of the cleanup action.

Protection monitoring is addressed in the HASPs prepared for the work. A HASP included as an appendix to the CMP (Attachment 4). Performance and confirmational monitoring requirements are presented in the CMP.

18.0 QUALITY ASSURANCE/QUALITY CONTROL

This section describes general quality assurance/quality control (QA/QC) procedures to be implemented during the American Plating Site Remediation Project, including contractor quality control, construction monitoring, and field documentation, and analytical QA/QC. Details regarding analytical QA/QC are presented in the Quality Assurance Project Plan (QAPP), included in the CMP (Attachment 4).

18.1. Contractor Quality Control

The Contractor will prepare a Construction Quality Assurance Plan before commencing work. The plan will be subject to review and approval by Engineer to ensure that the planned actions are in accordance with the contract requirements. The Construction Quality Assurance Plan will include plans for each of the primary elements of work and the quality control procedures to be implemented as part of the work. The quality control plan will address the following:

- Quality control organization;
- Quality control methods and procedures;
- Documentation of the methods and procedures;
- Corrective actions when QC and/or acceptance criteria are not met; and
- Any additional elements that the contractor deems necessary to adequately control work processes required by the contract.

The contractor will maintain QC records. These records will include evidence that quality control procedures, inspections or tests have been performed, including the type and number of inspections or tests involved; results of inspections or tests; nature of quality control deviations, causes of deviations, and corrective actions taken.

The work performed for Contractor Quality Control shall be incidental to other work that is performed by the Contractor.

In addition to the Contractor's quality assurance plan, the Engineer on behalf of the FWDA will perform oversight of the contractor's activities.

18.2. Construction Monitoring and Field Documentation

Construction monitoring will be performed by the Engineer. A comprehensive record of field activities will be maintained. Field documentation for this project will include field notes, field forms, field reports, and chain-of-custody forms for samples submitted for analytical testing. The field documentation will record construction, sampling, and monitoring activities, sampling

personnel, and weather conditions, as well as decisions, corrective actions, and/or modifications to the project plans and procedures specified in this EDR.

18.3. Analytical QA/QC

Analytical QA/QC is described in the QAPP provided in the CMP (Attachment 4). The QAPP describes soil and water sampling, analysis, and QC procedures that will be implemented to produce chemical and field data that are representative, valid, and accurate for use in evaluating the effectiveness of the cleanup action.

19.0 HEALTH AND SAFETY

The work completed as part of the American Plating Site Remediation Project will be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (RCW 49.17) and the Federal Occupational Safety and Health Act (29 CFR 1910, 1926). These regulations include requirements that workers are to be protected from exposure to contaminants.

The Contractor shall be solely and completely responsible for property conditions and safety during the term of the Contract. This obligation shall include the safety of all persons within or affected by the Contractor's limits of work and all private property affected by the work. The work performed by the Contractor for health and safety shall be incidental to other work that is performed by the Contractor.

The Contractor shall prepare a project-specific HASP for review by the Engineer prior to initiating work at the Site. The Engineer may provide noted exceptions after review of the Contractor's HASP, but the Engineer will not approve or be liable for the Contractor HASP.

The Contractor shall give a "clear and reasonable warning" to its employees and the general public for any workplace or environmental exposure that results from its activities during the course of this project

19.1. Contractor's Responsibility for Health and Safety

The Contractor's responsibility for health and safety shall include, but is not limited to, the following:

- The Contractor shall comply with any and all state and local ordinances and regulations.
- The Contractor shall have a duty of responsibility for the health and safety of Contractor's employees, its subcontractors, suppliers, agents, inspectors, visitors, the general public and any others associated with or interacting with the Contractor to provide labor, goods or other services on the job site.
- The Contractor shall be responsible for emergency response planning and notification and for actual response to any and all emergencies that may occur during the course of the work.
- The Contractor is responsible for communicating daily with the Engineer regarding health and safety issues for the Engineer's safe conduct of the Engineer's duties, but such communication shall not imply any duty or responsibility on the part of the Engineer with regard to health and

safety of the Contractor's employees, its subcontractors, suppliers, the general public or others. The Engineer's responsibility and duty with regard to health and safety shall be limited to the Engineer's employees. The Contractor shall have responsibility and duty to the Engineer to communicate health and safety issues accurately and in a timely manner to allow the Engineer to take appropriate actions to protect the Engineer's employees.

- The Contractor is responsible for understanding and acting in accordance with all requirements of this Section and the Contractor's HASP for the project.
- The Contractor shall designate a dedicated Contractor's Site Safety and Health Officer (SSHO) on the Site during the work that shall, at a minimum, have at least three years of experience as a SSHO on remediation projects similar to the current project and have 40-hour OSHA Hazardous Waste Operations training and 8-hour OSHA Hazardous Waste Supervisor training. Tenure of the Contractor's SSHO shall be subject to approval by the Engineer.
- The SSHO shall be present on site during all Contractor activities and working hours and shall enforce the requirements of safety for all Contractor personnel on site at all times. The SSHO shall ensure that all Contractor and its subcontractor personnel working at the Site, and Contractor visitors, follow the HASP, including wearing the designated level of personal protective equipment (PPE). If the SSHO elects to require a higher level of protection than that specified in the HASP, the extra costs associated with such higher level shall be borne by the Contractor, unless such extra costs are approved in advance in writing by the Engineer.
- Prior to mobilization and continually through the duration of the work, the SSHO shall inspect the Site and document area-specific and worker-specific protection requirements.
- After mobilization, the SSHO shall monitor activities and shall document the need for additional worker protection as required, based on activities performed and action levels specified in the HASP.
- The SSHO shall verify that all activities are performed in accordance with the Contractor's HASP and all federal, state, local, and health and safety standards, regulations and guidelines.
- In the event of a health and/or safety risk as determined by the SSHO or other Contractor personnel, or as determined by the Engineer, the Contractor shall not proceed with the work until a method for handling the risk has been determined in consultation with the Engineer and implemented. Any health or safety risk resulting in a stoppage of work shall be reported immediately to the Engineer.

19.2. Contractor's Health and Safety Submittals

The Contractor shall prepare and submit a HASP to the Engineer. The Contractor shall follow all applicable local, state and federal health and safety standards and guidelines implemented through, but not limited to, the OSHA, WISHA, NIOSH, ACGIH and U.S. EPA. Where these are in conflict, the most stringent requirement shall be followed. The following points shall be addressed in the Contractor's HASP:

- Names of key personnel with contact numbers and alternates responsible for health and safety, including a Contractor Health and Safety Representative and SSHO.
- A Safety Task Analysis Review (STAR) or Job Safety and Hazard Analysis (JSHA) associated with each portion of the Work (for example, list potential chemical and physical hazards).

- Employee and subcontractor training assignments to ensure compliance with 29 CFR 1910.120.
- A requirement that the Contractor locate underground utilities (if any) by using "Safe Dig" procedures prior to the start of the work.
- PPE to be used for each of the on-site tasks and operations being conducted, as required by the PPE program in 29 CFR 1910.120 and 29 CFR 1926.
- Medical surveillance requirements in accordance with the program in 29 CFR 1910.120.
- Indicate the frequency and types of air monitoring, personnel monitoring and environmental sampling techniques and instrumentation to be used by the Contractor, including methods of maintenance and calibration of monitoring and sampling equipment.
- Corrective actions and upgrading of personnel protection based on monitoring of air, personnel, and environmental sampling, with specific action levels identified.
- The on-site control measures in accordance with the control program required in 29 CFR 1910.120 and 29 CFR 1926.
- Decontamination procedures in accordance with 29 CFR 1910.120.
- An emergency response plan meeting federal, state and local requirements for safe and effective responses to emergencies, including the necessary PPE and other equipment.
- Explanation of potential emergencies and contingency plan of action, including description of the route to the nearest appropriate hospital and a hospital route map, and posting of emergency telephone numbers on site.
- A list of health and safety and emergency equipment available on site.
- A description of engineering controls used to reduce the hazards of equipment operation and exposure to on-site hazardous chemicals.
- Lockout/Tagout procedures where the operation of machinery and/or equipment in which the unexpected energization on startup or the release of stored energy could cause injury to personnel.
- Current respiratory fit testing certification

19.3. Notifications

The Contractor shall notify the Engineer under the following circumstances:

- The Contractor shall immediately verbally report (within 30 minutes) to the Engineer the occurrence of any and all health and safety incidents. An Incident Report form or Near Miss Report form, as appropriate, shall be submitted within 48 hours of occurrence of the incident or issue.
- The Contractor shall immediately and fully investigate any such incident or near miss and conduct a root cause analysis, and shall provide to the Engineer, the Contractor's written corrective action plan for such incident within one day after the incident occurs.
- The Contractor shall notify the Engineer in writing at least five days prior to bringing any hazardous material, equipment or process to the job site, or using the same on site. The

Contractor shall provide the Engineer with a material safety data sheet (MSDS) for all chemicals brought on site.

- The Contractor shall immediately notify the Engineer in writing of any hazard that the Contractor discovers or observes on site and corrective measures planned or taken to eliminate or minimize such hazard. Hazard reporting will be completed as a Near Miss Report.

19.4. Training Requirements

The Contractor shall provide the following training to each worker:

- Initial 40-hour (or 80-hour where appropriate) OSHA Hazardous Waste Health and Safety training and current annual 8-hour refresher training.
- Eight-hour OSHA Hazardous Waste Supervisory Training (required for the Contractor's Superintendent or SSHO).
- Current CPR and first aid certification for at least one worker assigned to work on site.

19.5. Work Planning and Meetings

- The Contractor shall conduct a Daily Health and Safety Meeting prior to beginning work for that day, to address health and safety issues, changing conditions, activities and personnel. All Contractor and subcontractor employees working on site on that day shall attend the meeting. All meetings shall be documented, and attendees shall sign acknowledgement of their presence at the meeting. Daily meetings will include an evaluation of the work performed that day. Meeting attendance and discussion points will be documented daily and a copy will be provided to the Engineer.
- Subcontractor personnel who are not in attendance for the Daily Health and Safety Meeting shall be briefed on the meeting notes upon arrival at the job site and prior to commencing their work activities. Employees shall sign acknowledgement of briefings prior to commencing work.
- The Contractor shall hold and document additional safety meetings at the start of each major task and whenever on-site conditions affecting personnel safety change. Any major task undertaken will require the completion of a JSHA.

19.6. Engineering Controls

The Contractor shall, at a minimum, provide the following engineering controls to reduce the hazards of equipment operation and exposure to on-site hazardous materials:

- Rollover cages for bulldozers, backhoes, loaders and tractors.
- Backup alarms for all trucks and moving equipment.
- Wetting of soil or other means to control dust during the work.
- Decontamination of personnel and equipment in accordance with these Contract Documents.
- Others as determined to be necessary or prudent by the Contractor or as determined by the Engineer.

19.7. Monitoring

The Contractor shall, at a minimum, perform the following monitoring:

- The Contractor shall maintain an appropriate air monitoring program and an industrial hygiene program, including the use of proper equipment for routine air monitoring, calibration records, air monitoring results and training personnel to assist the SSHO in these duties.
- The Contractor shall perform heat exposure and cold exposure monitoring activities as required by weather conditions.

19.8. Personal Protective Equipment (PPE)

The Contractor's PPE requirements shall include the following:

- The appropriate level of PPE shall be determined by the Contractor for specific tasks as described in the Contractor's HASP. If hazards are identified that require a level of protection greater than Level C, work shall be suspended and the Engineer notified. The Contractor's SSHO, in consultation with the Engineer, shall determine what actions are required prior to restarting work. The Contractor shall determine and document the appropriateness of suggested minimum PPE requirements for Contractor's employees and others at the job site.
- At a minimum, all personnel and visitors on site shall wear Level D PPE, except in Support Zone areas. Level D PPE consists of:
    - Hard hat.
    - Steel-toed boots.
    - Safety glasses with permanent side shields.
    - Work clothes (long pants, shirts with sleeves).
    - Orange reflective safety vests.
    - Work gloves (as required).
    - Hearing protection (as required to prevent exposure to noise exceeding 85 dB).
- The Contractor shall furnish and maintain materials and equipment for the health and safety of Contractor employees, its subcontractors, suppliers and visitor personnel. The Contractor shall provide all required health and safety equipment, first aid equipment, tools, monitoring equipment, PPE and ancillary equipment and methods required to ensure workers' health and safety and to comply with the HASP. The Engineer will furnish PPE and monitoring for Engineer's employees.
- If additional protection consisting of Level C PPE is required during work, Level C PPE will include protection from organic compounds and consist of Level D protection with the following additions:
    - Air purifying respirator, half-face or full-face (depending on required protection factor) with organic vapor/High Efficiency Particulate Air Cartridges meeting NIOSH/Mine Safety and Health Administration Specifications.
    - Disposable poly-coated chemically protective coveralls.
    - Disposable chemically resistant outer gloves (nitrile).
    - Disposable chemically resistant inner gloves (nitrile).
    - Chemically resistant, steel-toed and steel-shanked boots (polyvinyl chloride [PVC], neoprene, or nitrile) or outer booties.

- In most cases, Level C will be the maximum allowed level of PPE; however, Level B may be allowed provided that personnel are properly trained and/or certified and exposure levels are below immediately dangerous to life or health (IDLH) conditions.

19.9. Other Health and Safety Equipment

The Contractor is required to have the following equipment available on site for the health and safety of subcontractors, sub-subcontractors, suppliers and visitors:

- Air monitoring instruments, including (but not limited to):
  - Organic vapor meter.
  - Combustible gas indicator.
  - Dust particulate meter.
- First aid kits.
- Fire suppression equipment (appropriate to location and type of flammable materials present).
- OSHA-approved emergency eyewash facilities.
- Personnel decontamination facilities and equipment.
- Flammable liquids storage cabinet.
- Fall protection equipment.
- Other equipment or supplies as determined to be necessary or prudent by Contractor or the Engineer.

19.10. Evaluation of Performance

- The Contractor shall routinely conduct internal safety audits on the work to verify that work is being performed in accordance with the Contractor's HASP. These routine audits will focus on compliance with OSHA and WISHA safety regulations.
- The Contractor shall conduct routine behavioral observations and provide immediate feedback during work activities to promote safe behavior of Contractor employees and subcontractor employees.

19.11. Exclusion Zone Plan

The Contractor shall prepare a project-specific Exclusion Zone Plan. The plan shall locate an Exclusion Zone, a Decontamination Zone and a Support Zone. The Exclusion Zone shall contain only the activities necessary for the completion of hazardous work. The plan shall document decontamination procedures containing, at a minimum, the following information:

- Decontamination methods and equipment that will be used.
- Procedures to prevent contamination of clean areas.
- Methods and procedures to minimize worker contact with contaminants during removal of personal protective clothing and equipment.
- Procedures for decontamination of vehicles, equipment and personnel that enter the Exclusion Zone and leave the job site.

- Procedures for disposal of clothing and equipment that is not completely decontaminated.
- Procedures for the collection, treatment and disposal of all decontamination water, sludge and wastes.

The Exclusion Zone and Decontamination Zone shall be secured during nonworking hours. Access to the Exclusion Zone during working hours shall be controlled by the Contractor through a designated access point.

20.0 SCHEDULE

Pending project approvals, the work is scheduled to begin in April or May 2012. The construction duration is estimated to be approximately four to six weeks.

21.0 SUBMITTALS

The Contractor shall submit one (1) copy, unless otherwise noted, of the documents included in the table below in accordance with the delivery schedule. The Engineer will review the documents and if any modifications are requested, the Contractor shall submit copies of the modified documents before beginning on-site work. The required submittals and delivery dates required for these submittals are shown below. The work performed by the Contractor to prepare Contractor submittals shall be incidental to other work that is performed by the Contractor.

CONTRACTOR SUBMITTALS

Submittal	Delivery Schedule
Project Work Plan and Schedule (sequence of work, materials management, property layout, construction schedule including milestones, etc.) – three copies	Pre-construction conference
Imported Backfill and Capping Material Sources and Grain Size and Modified Proctor Test Results	Pre-construction conference
Water Management Plan – three copies	Pre-construction conference
Disposal and Recycling Facilities (company name, disposal facility and location)	Pre-construction conference
Contractor Health and Safety Plan (HASP) – three copies	Pre-construction conference
Construction Stormwater Pollution and Prevention Plan (SWPPP) and Temporary Erosion and Sediment Control Plan (TESC) – three copies	Pre-construction conference
Construction Spill Control and Countermeasure Plan (SPCC) – three copies	Pre-construction conference
Contractor Quality Assurance Plan – three copies	Pre-construction conference
Exclusion Zone Plan (plans and procedures to maintain secure exclusion zone) and traffic control plan – three copies	Pre-construction conference
Monitoring Well Decommissioning Documentation	Five days after decommissioning activities
Waste Material Manifests, Weight Tickets, and Disposal Receipts	Two days after material disposal

Submittal	Delivery Schedule
Backfill and Capping Material Weight Tickets	Upon delivery
Water Treatment System and Water Discharge Documentations	Three days after acceptance of work
Surveys (post-excavation, backfill and pre-capping, and post-capping and restoration as-built survey	Three days after acceptance of work

Note:
The term 'day' shall be considered a weekday (Monday through Friday) excluding holidays recognized by the City of Tacoma.

22.0 REPORTING

The following reports will be prepared by the Engineer to document the work performed as part of the American Plating Site Remediation Project:

- **Remedial Action Construction Report (RACR) –** Upon completion of American Plating Site Remediation Project, a RACR summarizing the remediation and results of performance monitoring will be prepared in accordance with WAC 173-340-400. Waste manifests, contaminated soil disposal receipts, and as-built drawings will be included in the RACR. A draft version of the RACR will be submitted to FWDA and Ecology for review and comment prior to finalization.
- **Confirmational Groundwater Monitoring Report** – A report summarizing the results of confirmational groundwater monitoring will be prepared upon completion of groundwater monitoring activities.
- **Monthly Progress Report –** A monthly progress report will be made by FWDA to Ecology as required by the Consent Decree.

Compliance monitoring data generated during the cleanup action will be provided to Ecology in the electronic format required by Ecology's Environmental Information Management Policy 840.

23.0 REFERENCES

Applied Geotechnology , Inc. (AGI, 1989). Phase II Soil and Groundwater Investigation, American Plating Co. Facility.

Cleanup Levels and Risk Calculations (CLARC). MTCA Cleanup Regulation Chapter 173-340 WAC https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx

GeoEngineers, Inc. (GeoEngineers, 2003). Final Draft Cleanup Action Plan. Former American Plating, Inc., 2110 East D Street, Tacoma, Washington. For Thea Foss Waterway Development Authority. GEI File No. 10751-002-00. November 24, 2003.

Washington State Department of Ecology (Ecology, 2010). American Plating Post-Interim-Action Groundwater Monitoring Results April and October, 2010. February 2011.

Washington State Department of Ecology (Ecology, 2005). Stormwater Management Manual for Western Washington.

24.0 LIMITATIONS

We have prepared this report for the exclusive use of Foss Waterway Development Authority and their authorized agents for the American Plating Site Remediation Project in Tacoma, Washington.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

TABLE 1

SOIL CLEANUP LEVELS[1]

AMERICAN PLATING SITE REMEDIATION PROJECT

TACOMA, WASHINGTON

Chemicals of Concern[2]	Site Cleanup Levels (mg/kg)
Cadmium	80
Chromium VI	240
Copper	2,960
Lead	250[3]
Nickel	1,600
Cyanide, total	1,600
Vinyl Chloride	0.667

Notes:

[1] The Site cleanup levels for soil are the Model Toxics Control Act (MTCA) Method B soil cleanup levels for unrestricted land use.

[2] Chemicals of concern for the Site were developed as part of the Site Interim Cleanup Action Plan (SAIC, 2003).

[3] A MTCA Method B cleanup level for lead has not been established. Therefore, the MTCA Method A cleanup level for unrestricted land use was used.

mg/kg = miligram per kilogram

TABLE 2

GROUNDWATER CLEANUP LEVELS[1]

AMERICAN PLATING SITE REMEDIATION PROJECT

TACOMA, WASHINGTON

Chemicals of Concern[2]	State Surface Water Quality Standards[3] (Protection of Aquatic Organisms, Acute Exposure) (µg/l)	State Surface Water Quality Standards[3] (Protection of Aquatic Organisms, Chronic Exposure) (µg/l)
Cadmium	42	9.3
Chromium	NE	NE
Chromium VI	1,100	50
Copper	4.8	3.1
Nickel	74	8.2
Cyanide	1(WAD)[4]	1(WAD)[4]

Notes:

[1] The Site cleanup levels for groundwater are the State Surface Water Quality Standards (Chapter 173-201A WAC) for the groundwater to surface water pathway.

[2] Chemicals of concern for the Site were developed as part of the Site Interim Cleanup Action Plan (SAIC, 2003).

[3] Chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington.

[4] Weak Acid Dissociable (WAD).

NE = Not established

µg/l = microgram per liter

TABLE 3

MATERIALS TYPE, MANAGEMENT AND DISPOSAL

AMERICAN PLATING SITE REMEDIATION PROJECT

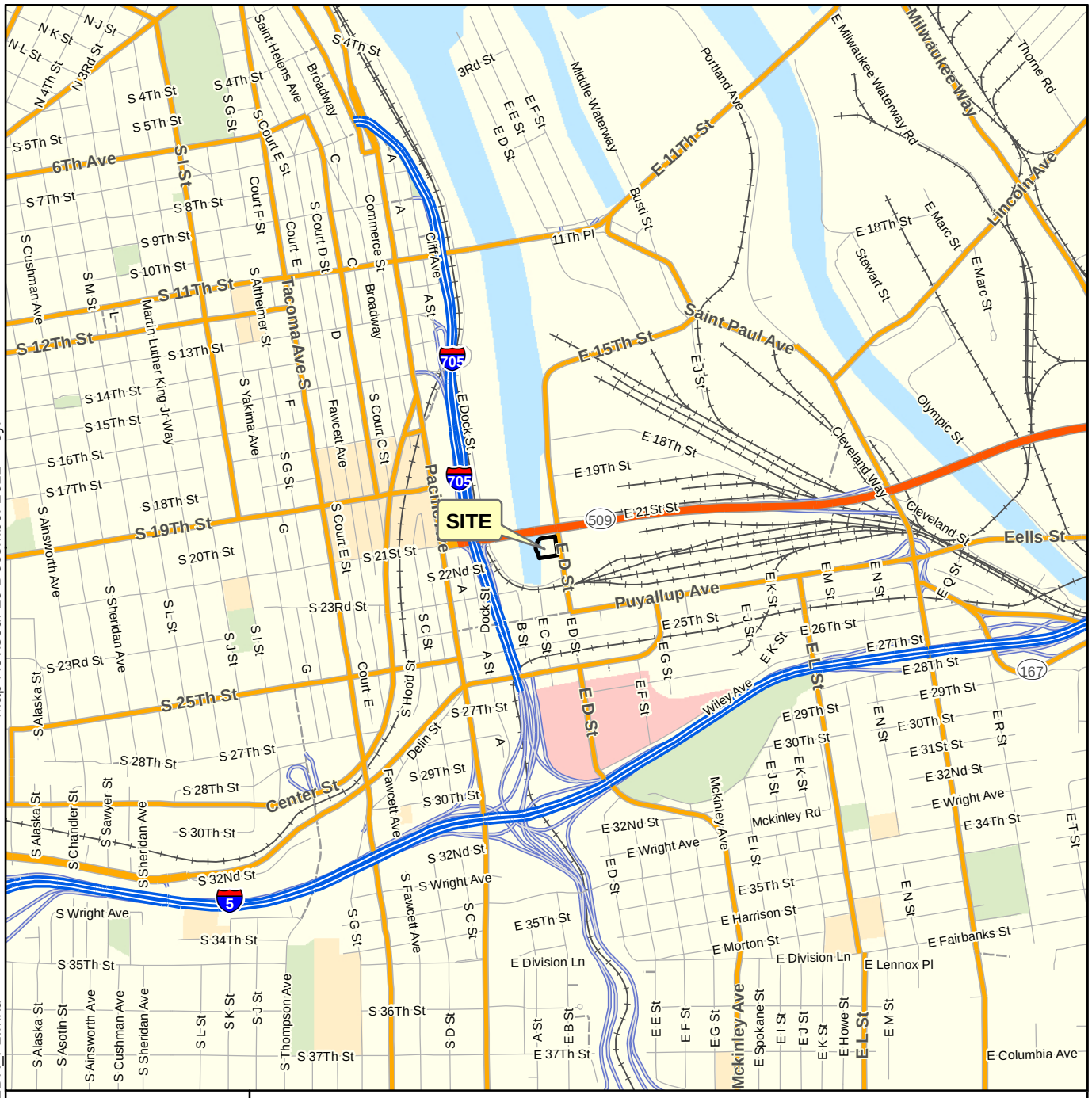
TACOMA, WASHINGTON

Material Type	Description of Material	Source of Material	Method of Material Management	Method of Disposal[1,2]
Vegetation	Above ground components of Site vegetation	Clearing and Grubbing	Minimize contact with Site soil and keep separate from other materials	Dispose of as landclearing debris
	Below ground components of Site Vegetation in contact with or containing Site soil	Clearing and Grubbing	Place in a stockpiled materials management area separate from other stockpiled materials	Disposal facility, Subtitle D or Subtitle C landfill, will be selected based on results of stockpile sampling and analysis
Trash	Paper, glass, wood, and other materials typical of municipal solid waste	Trash and Debris Collection and Management	Minimize contact with Site soil and keep separate from other materials	Dispose of at Subtitle D landfill
	Metal (excluding chainlink fencing to be removed, protected, and reinstalled during Site restoration)	Trash and Debris Collection and Management	Minimize contact with Site soil and keep separate from other materials	Recycle at recycling facility
		Removal of Existing Fencing		
Asphalt Debris	Remnant asphalt surfacing material located in various areas around the site (excluding asphalt debris resulting from demolition of existing access roadway)	Trash and Debris Collection and Management	Place in a stockpiled materials management area separate from other stockpiled materials	Dispose of at Subtitle D landfill
		Demolition of Asphalt and Concrete Surfaces and Structures		
	Asphalt surfacing from existing access roadway	Demolition of Asphalt and Concrete Surfaces and Structures	Minimize contact with Site soil and keep separate from other materials	Recycle at construction debris recycling facility
Soil and Debris	Material excavated from Remedial Excavation Area (REA) 1	Remedial Excavation Area (REA) 1	Place in a stockpiled materials management area separate from other stockpiled materials	Disposal facility, Subtitle D or Subtitle C landfill, will be selected based on results of stockpile sampling and analysis
	Material excavated from Remedial Excavation Area (REA) 2	Remedial Excavation Area (REA) 2	Place in a stockpiled materials management area separate from other stockpiled materials	Disposal facility, Subtitle D or Subtitle C landfill, will be selected based on results of stockpile sampling and analysis
	Material excavated from Utility Corridor Area (UCA) 1	Utility Corridor Area (UCA) 1	Place in a stockpiled materials management area separate from other stockpiled materials	Disposal facility, Subtitle D or Subtitle C landfill, will be selected based on results of stockpile sampling and analysis
	Material excavated from Utility Corridor Area (UCA) 2	Utility Corridor Area (UCA) 2	Place in a stockpiled materials management area separate from other stockpiled materials	Disposal facility, Subtitle D or Subtitle C landfill, will be selected based on results of stockpile sampling and analysis
	Material excavated from Utility Corridor Area (UCA) 3	Utility Corridor Area (UCA) 3	Place in a stockpiled materials management area separate from other stockpiled materials	Disposal facility, Subtitle D or Subtitle C landfill, will be selected based on results of stockpile sampling and analysis

Notes:

[1] Disposal includes recycling where specified and appropriate.

[2] The method of disposal as well as the disposal facility and disposal location must be approved by the Engineer prior to disposal.



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

Engineering Design Report
American Plating Site Remediation Project
Tacoma, Washington

GeoEngineers

Figure 1

Office: TAC Path: P:\10\10751002\GIS\1075100201_EDR_F1.mxd Map Revised: 16 December 2011 syi



Data Source: Aerial image from Aerials Express Seattle, 2009.
Sample locations provided by Marv Coleman, Ecology Personal Communication, November 2003.

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Notes:
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Legend

- Existing Monitoring Well Number and Approximate Location
- American Plating Site Boundary
- Ordinary High Water Line

N W E S

0 50
Feet

American Plating Site

Engineering Design Report
American Plating Site Remediation Project
Tacoma, Washington

GeoEngineers

Figure 2

Map Revised: 26 January 2012 syi
Path: P:\10\10751002\GIS\10751002O1_EDR_F2.mxd
Office: SEA



Data Source: Aerial image from Aerials Express Seattle, 2009.
Sample locations provided by Marv Coleman,
Ecology Personal Communication, November 2003.

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Legend

- Existing Monitoring Well Number and Approximate Location To be Decommissioned During Remedial Action
- New Monitoring Well Number and Approximate Location To be Installed After Remedial Action
- Ordinary High Water Line
- Remedial Excavation Area (REA)
- Utility Corridor Excavation Area (UCA)
- **REA 1** Remedial Excavation Area 1
- **UCA 1** Utility Corridor Excavation Area 1
- American Plating Remediation Project Boundary and Area of Site Capping

N W E S

0 50
Feet

Overview of Remaining Remedial Actions

Engineering Design Report
American Plating Site Remediation Project
Tacoma, Washington

GeoEngineers

Figure 3

Map Revised: 27 January 2012 syi
Path: P:\101\0751002\GIS\1075100201_EDR_F3.mxd
Office: SEA

FOSS WATERWAY DEVELOPMENT AUTHORITY
AMERICAN PLATING SITE REMEDIATION PROJECT
TACOMA, WASHINGTON

LOCATION MAP



Sheet Notes:
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2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: ESRI Data & Maps, Street Maps 2005. Aerial photo from ESRI I3 Aerial Imagery.

Horizontal datum: Lambert Conformal Conic, Washington State Plane South, North American Datum 1983.

500 0 500 1,000
Scale in Feet

OWNER
FOSS WATERWAY DEVELOPMENT AUTHORITY
535 EAST DOCK STREET, SUITE 204
TACOMA, WA 98402
PHONE: (253) 597-8122
CONTACT: SU DOWIE

ENVIRONMENTAL ENGINEER
GEOENGINEERS, INC.
1101 S. FAWCETT AVENUE, SUITE 200
TACOMA, WA 98402
PHONE: (253) 383-4940
FAX: (253) 383-4923
CONTACT: IAIN WINGARD/NICK ROHRBACH

CIVIL ENGINEER
AHBL, INC.
2215 NORTH 30TH STREET, SUITE 300
TACOMA, WA 98403
PHONE: (253) 383-2422
FAX: (253) 383-2572
CONTACT: DAVID NASON/WAYNE CARLSON

SURVEYOR
AHBL, INC.
2215 NORTH 30TH STREET, SUITE 300
TACOMA, WA 98403
PHONE: (253) 383-2422
FAX: (253) 383-2572
CONTACT: DAVID FOLLANSBEE, PLS

INDEX OF DRAWINGS

SHEET NUMBER	DESCRIPTION
G1.0	Cover Sheet
C1.0	Existing Conditions
C2.0	Site Preparation and Demolition Plan
C2.1	Site Preparation and Demolition Plan Details
C2.2	Site Preparation and Demolition Plan Details
C3.0	Excavation Plan
C4.0	Site Grading and Capping Plan
C4.1	Site Grading and Capping Details
C4.2	Site Grading and Capping Sections
C4.3	Site Grading and Capping Sections
C4.4	Site Grading and Capping Sections
C4.5	Utility Corridor Areas (UCA) Details
C4.6	Utility Corridor Areas (UCA) Details
C5.0	Site Restoration Plan
C5.1	Site Restoration Plan Details
C5.2	Site Restoration Plan Details

CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555

GeoEngineers
1101 S. Fawcett Avenue, Suite 200
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Telephone (253) 383-4940
Fax (253) 383-4923

Structural Engineers
Landscape Architects
Community Planners
Land Surveyors
Neighbors
AHBL
TACOMA · SEATTLE
2215 North 30th Street, Suite 300, Tacoma, WA 98403
253.383.2422 TEL
1200 Sixth Avenue, Suite 1620, Seattle, WA 98101

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED			
BY			
DATE			
FIELD BOOKS			

DATE 01/26/2012	SCALE AS NOTED	
DESIGNED NER/IHW	CHECKED CLB	
DRAWN SCY	PROJECT NAME 10751-002-01	
DRAWING NAME 1075100201_G1.0		

1/26/12 CHRISTOPHER LEWIS BAILEY — STATE OF WASHINGTON — 39963 — REGISTERED PROFESSIONAL ENGINEER

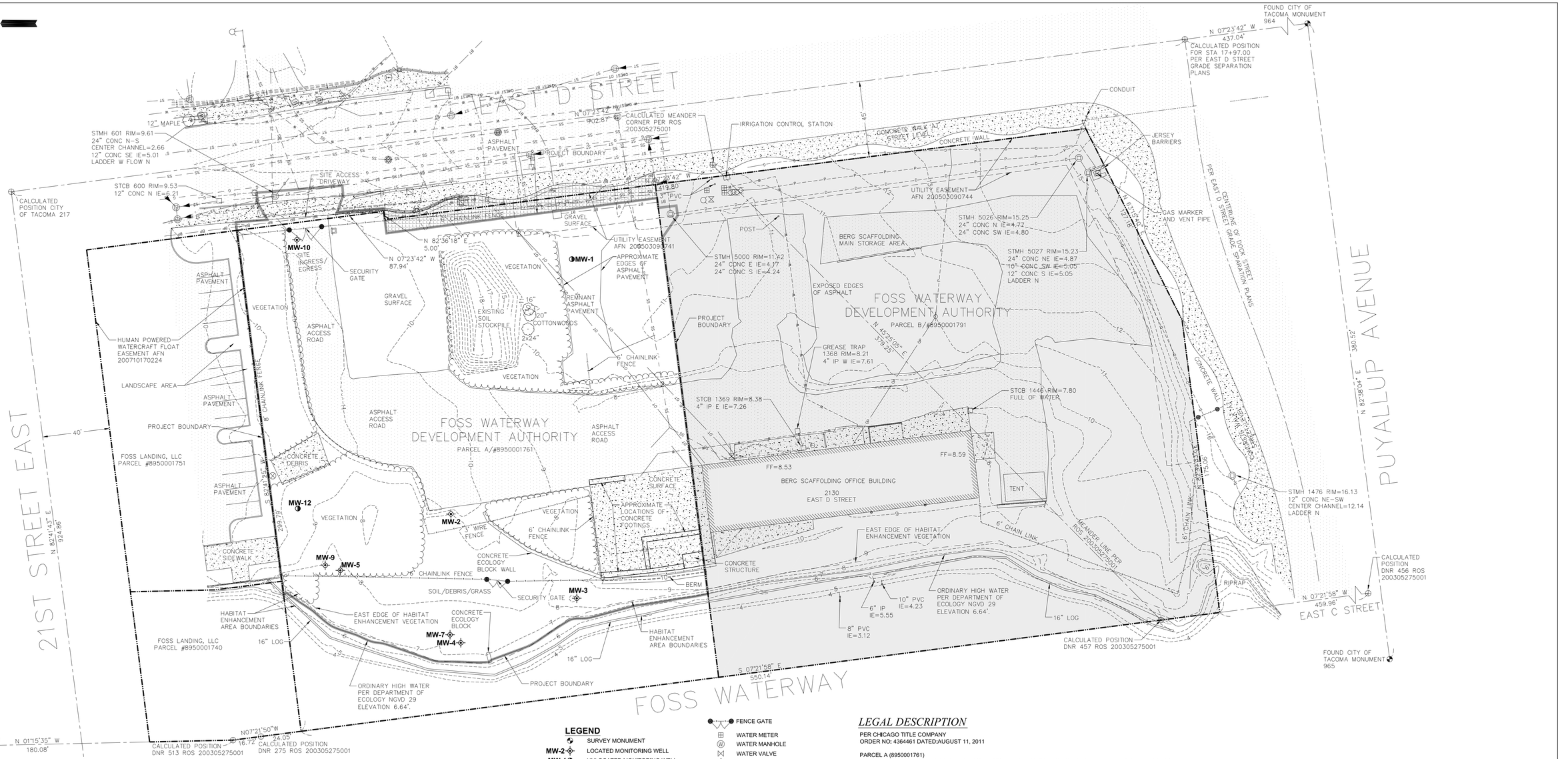
CONSTRUCTION DIVISION

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

American Plating Site Remediation Project
Tacoma, Washington
Cover Sheet

SHEET NO. G1.0
SHEET 1 OF 16

TACO:NER : SCY
P:\10\10751002\01\CAD\1075100201_G1.0.dwg\TAB:G1.0 modified on Jan 26, 2012 - 7:00pm



TACO:NER : SCY

P:\10\10751002\01\CAD\10751002O1_C1.0.dwgITAB:C1.0 modified on Jan 26, 2012 - 7:08pm

CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555

30 0 30 60
Scale in Feet

Reference: Base CAD drawing provided by AHBL, dated 08-26-2011.

LEGEND

- SURVEY MONUMENT
- MW-2 LOCATED MONITORING WELL
- MW-1 UNLOCATED MONITORING WELL
- BOLLARD
- SIGN AS NOTED
- STORM CLEANOUT
- STORM CATCH BASIN
- FSTORM MANHOLE
- GAS VALVE
- GUY ANCHOR
- UTILITY POWER POLE
- JUNCTION BOX
- LUMINAIRE
- COMMUNICATIONS MANHOLE
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- ADJUSTED MANHOLE
- ABANDONED MANHOLE
- PARCEL BOUNDARY
- PROJECT BOUNDARY
- CONTRACTOR SHALL NOT OPERATE IN THIS AREA
- FENCE GATE
- WATER METER
- WATER MANHOLE
- WATER VALVE
- DECIDUOUS TREE AS NOTED
- GATE POST
- APPROXIMATE LOCATION OF NINE 55-GALLON STEEL DRUMS
- QWEST OT — QWEST OVERHEAD COMMUNICATION
- QWEST BT — QWEST BURIED CABLE LINE
- ST — ST — STORM SEWER LINE
- BP — BP — BURIED POWER LINE
- BT — BT — BURIED CABLE LINE
- SS — SANITARY SEWER LINE
- G — GAS LINE
- W — WATER LINE
- T — COMMUNICATION LINE
- P — POWER LINE
- D — STORM LINE
- OP — OVERHEAD POWER
- OT — OVERHEAD COMMUNICATION
- X — X — FENCE
- PARCEL 8950001791 NOT FOR CONSTRUCTION
- AREA OF VEGETATION, DEBRIS, TRASH, REMNANT ASPHALT PAVEMENT, CONCRETE AND WOOD

NOTES TO CONTRACTOR

1. THE LOCATIONS OF ALL FEATURES SHOWN ARE APPROXIMATE.

2. THIS DRAWING IS FOR INFORMATION PURPOSES. IT IS INTENDED TO ASSIST IN SHOWING FEATURES DISCUSSED IN AN ATTACHED DOCUMENT. GEOENGINEERS, INC. CANNOT GUARANTEE THE ACCURACY AND CONTENT OF ELECTRONIC FILES. THE MASTER FILE IS STORED BY GEOENGINEERS, INC. AND WILL SERVE AS THE OFFICIAL RECORD OF THIS COMMUNICATION.

3. THIS SURVEY WAS PREPARED BY AHBL, INC, AT THE TIME OF FIELD SURVEY, THE SITE WAS AN ACTIVE SCAFFOLDING YARD. LARGE PORTIONS OF PARCEL A WERE COVERED WITH SCAFFOLDING AND OTHER EQUIPMENT. GEOENGINEERS PERFORMED FOLLOW-UP FIELD OBSERVATIONS, THAT ARE INCLUDED IN THIS DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING THE EXISTING CONDITIONS PRIOR TO INIATING ANY PROJECT WORK.

4. ORDINARY HIGH WATER ELEVATION SHOWN HEREON WAS PER DEPARTMENT OF ECOLOGY MARK SET ON FOSS WATERWAY FOR URBAN WATERS PROJECT LOCATED AT 326 EAST D STREET.

5. SURFACE UTILITY FACILITIES ARE SHOWN HEREON PER FIELD LOCATED VISIBLE EVIDENCE AND OTHER INFORMATION PROVIDED BY THE CITY OF TACOMA. THERE MAY BE UTILITIES THAT EXIST ON THIS SITE OTHER THAN THOSE GRAPHICALLY DEPICTED HEREON.

6. UNDERGROUND (BURIED) UTILITIES SHOWN HEREON ARE BASED ON A COMBINATION OF VISIBLE SURFACE EVIDENCE, UTILITY LOCATOR MARKINGS AND OTHER INFORMATION PROVIDED BY THE CITY OF TACOMA. ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND, IN SOME CASES, ARE SHOWN AS STRAIGHT LINES BETWEEN FIELD LOCATED SURFACE UTILITY FACILITIES. UNDERGROUND UTILITIES MAY HAVE BENDS, CURVES OR CONNECTIONS WHICH ARE NOT SHOWN.

7. AHBL, INC. AND GEOENGINEERS ASSUMES NO LIABILITY FOR THE ACCURACY OF SAID UTILITY DATA. THE CONTRACTOR IS RESPONSIBLE FOR FIELD LOCATING ALL EXISTING UTILITIES AND SHALL USE ALL APPROPRIATE METHODS TO LOCATE UTILITIES PRESENT ONSITE, SUCH METHODS MAY INCLUDE, BUT ARE NOT LIMITED TO, SUBCONTRACTING FOR UTILITY LOCATING SERVICES AND POTHOLING USING SAFE DIG TECHNOLOGIES.

8. CALL 1-800-424-5555 BEFORE ANY CONSTRUCTION.

LEGAL DESCRIPTION

PER CHICAGO TITLE COMPANY
ORDER NO: 4364461 DATED:AUGUST 11, 2011

PARCEL A (8950001761)
LOTS 3 TO 12, INCLUSIVE, BLOCK 55, MAP OF TACOMA TIDE LANDS AS SURVEYED AND PLATTED BY THE BOARD OF TIDE LANDS APPRAISERS FOR PIERCE COUNTY, ACCORDING TO THE PLAT FILED FOR RECORD SEPTEMBER 14, 1895, RECORDS OF PIERCE COUNTY AUDITOR.

EXCEPT THAT PORTION THEREOF CONVEYED TO THE CITY OF TACOMA BY SPECIAL WARRANTY DEED RECORDED UNDER RECORDING NUMBER 200503090740.

PARCEL B (8950001791)
LOTS 13 TO 23, INCLUSIVE, BLOCK 55, MAP OF TACOMA TIDE LANDS AS SURVEYED AND PLATTED BY THE BOARD OF TIDE LANDS APPRAISERS FOR PIERCE COUNTY, ACCORDING TO THE PLAT FILED FOR RECORD SEPTEMBER 14, 1895, RECORDS OF PIERCE COUNTY AUDITOR.

ALSO LOTS 18 TO 23, INCLUSIVE, BLOCK 7119, AND LOTS 13 TO 23, BLOCK 7120, THE TACOMA LAND COMPANY'S FIRST ADDITION TO TACOMA, W.T., ACCORDING TO PLAT FILED FOR RECORD JULY 7, 1884, RECORDS OF PIERCE COUNTY AUDITOR.

EXCEPT THAT PORTION OF SAID LOT 23, BLOCK 7120, AS CONVEYED TO THE CITY OF TACOMA BY DEED RECORDED UNDER RECORDING NUMBER 8208240159, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF LOT 23 OF SAID BLOCK 7120; THENCE NORTH ALONG THE EAST LINE OF SAID BLOCK 7120 A DISTANCE OF 44 FEET; THENCE SOUTHWESTERLY TO A POINT ON THE SOUTH LINE OF SAID LOT 23, SAID POINT BEING 125 FEET WEST OF THE SOUTHEAST CORNER OF LOT 23; THENCE EAST ALONG THE SOUTH LINE OF SAID LOT 23 A DISTANCE OF 125 FEET TO THE POINT OF BEGINNING.

ALSO EXCEPT THAT PORTION THEREOF CONVEYED TO THE CITY OF TACOMA BY SPECIAL WARRANTY DEED RECORDED UNDER RECORDING NUMBER 200503090743.

ALL SITUATED IN THE CITY OF TACOMA, COUNTY OF PIERCE, STATE OF WASHINGTON.

EQUIPMENT USED

3" TOTAL STATION UTILIZING STANDARD FIELD TRAVERSE METHODS FOR CONTROL AND STAKING.

DATUM

1. VERTICAL: NGVD 29
CITY OF TACOMA VERTICAL BENCHMARK 1979
ELEVATION: 10.502.

2. HORIZONTAL: NAD 83-91 WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE
CITY OF TACOMA HORIZONTAL CONTROL HOLDING MONUMENT NUMBERS 214 AND 216.

3. POINT NO. 214
N=704657.792, E=1161062.446
AT THE INTERSECTION OF E 15TH ST W/ D ST.

4. POINT NO. 216
N=703211.437, E=1161010.282
AT THE INTERSECTION OF E 19TH ST W/ D ST.

5. A LINE BETWEEN THE TWO FOUND MONUMENTS BEARS NORTH 02°03'56" EAST.

DATUM

GEOENGINEERS
1101 S. Fawcett Avenue, Suite 200
Tacoma, WA 98402
Telephone (253) 383-4940
Fax (253) 383-4923

Structural Engineers
Landscape Architects
Community Planners
Land Surveyors
Neighbors

AHBL
TACOMA · SEATTLE
2215 North 30th Street, Suite 300, Tacoma, WA 98403
253.383.2422 TEL
1200 Sixth Avenue, Suite 1620, Seattle, WA 98101

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED	DATE	01/26/2012	SCALE AS NOTED
BY	DESIGNED	NER/IHW	CHECKED CLB
DATE	DRAWN	SCY	PROJECT NAME 10751-002-01
FIELD BOOKS	DRAWING NAME	1075100201_C1.0	

1/26/12 — CHRISTOPHER LEWIS BAILEY — STATE OF WASHINGTON — 37963 — REGISTERED PROFESSIONAL ENGINEER

CONSTRUCTION DIVISION

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

American Plating Site Remediation Project
Tacoma, Washington
Existing Conditions

SHEET NO. C1.0
SHEET 2 OF 16



LEGEND

- MW-2 LOCATED MONITORING WELL
- MW-1 UNLOCATED MONITORING WELL
- BOLLARD
- SIGN AS NOTED
- STORM CLEANOUT
- STORM CATCH BASIN
- FSTORM MANHOLE
- GAS VALVE
- GUY ANCHOR
- UTILITY POWER POLE
- JUNCTION BOX
- LUMINAIRE
- COMMUNICATIONS MANHOLE
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- ABANDONED MANHOLE
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- PROJECT BOUNDARY
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- BT — BURIED CABLE LINE
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- G — GAS LINE
- W — WATER LINE
- T — COMMUNICATION LINE
- P — POWER LINE
- D — STORM LINE
- OP — OVERHEAD POWER
- OT — OVERHEAD COMMUNICATION
- X — FENCE
- PARCEL 8950001791 NOT FOR CONSTRUCTION
- CONTRACTOR SHALL NOT OPERATE IN THIS AREA

TESC AND DEMOLITION LEGEND

- IP INLET SEDIMENT PROTECTION
- CL CLEARING LIMITS
- FF FILTER FABRIC FENCE
- CE CONSTRUCTION ENTRANCE
- SL SAWCUT LINE
- PB PROTECTION BARRIER
- DEMOLISH/REMOVE ASPHALT AND UNDERLYING BASE COURSE
- DEMOLISH CONCRETE SURFACES, FOUNDATIONS, AND FOOTINGS
- DEMOLISH/REMOVE VEGETATION, DEBRIS, TRASH, REMNANT ASPHALT PAVEMENT, CONCRETE AND WOOD

CONSTRUCTION SEQUENCE

1. ARRANGE AND ATTEND PRE-CONSTRUCTION MEETING WITH THE ENGINEER.
2. THE CONTRACTOR SHALL SURVEY EXISTING CONDITIONS AND FLAG THE PROJECT LIMITS.
3. ESTABLISH PROJECT WATER MANAGEMENT SYSTEM IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND CONTRACTOR'S APPROVED PLAN.
4. CONSTRUCT ALL TEMPORARY EROSION CONTROL BMPs. CONSTRUCT FILTER FABRIC FENCE, WESTERN PROJECT BOUNDARY PROTECTION BARRIER, TEMPORARY INTERCEPTOR SWALES, AND TEMPORARY SEDIMENT TRAPS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PLANS. INSTALL INLET SEDIMENT PROTECTION IN EXISTING, ADJACENT CATCH BASINS. INSTALL CONSTRUCTION ENTRANCE.
5. CLEAR AND GRUB IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PLANS.
6. DEMOLISH EXISTING SITE FEATURES IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PLANS.
7. MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE PROJECT SWPPP, CONSTRUCTION GENERAL STORMWATER PERMIT, AND PROJECT SPECIFICATIONS AND PLANS.
8. EXCAVATE AREAS INDICATED FOR REMOVAL, ALL EXCAVATING AND GRADING SHALL BE DONE IN CONFORMANCE WITH THE PROJECT SPECIFICATIONS AND PLANS.
9. APPLY VISQUINE COVERING, STRAW MULCH, OR EQUAL TO AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE OR PERMANENTLY VEGETATED WITHIN 7 DAYS OF EXPOSURE DURING THE DRY SEASON, AND 2 DAYS OF EXPOSURE DURING THE WET SEASON, (OCTOBER 1 THROUGH APRIL 30)
10. CONSTRUCT STORM DRAINAGE FEATURES.
11. EXCAVATE / GRADE SITE IN ACCORDANCE WITH PROJECT SPECIFICATIONS AND GRADING PLAN.
12. RELOCATE EROSION CONTROL MEASURES OR INSTALL NEW MEASURES SO THAT, AS SITE CONDITIONS CHANGE, THE EROSION AND SEDIMENT CONTROL IS ALWAYS IN ACCORDANCE WITH THE PROJECT SWPPP, CONSTRUCTION GENERAL STORMWATER PERMIT AND PROJECT SPECIFICATIONS AND PLANS.
13. PERFORM SITE CAPPING IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PLANS. ENSURE SURFACE WATER IS POSITIVELY DIRECTED TOWARD STORMWATER CONTROL FACILITIES.
14. PERFORM SITE RESTORATION IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PLANS.
15. COMPLETE SITE STABILIZATION.
16. REMOVE THE REMAINING TEMPORARY EROSION CONTROL ITEMS ONCE SITE HAS BEEN STABILIZED AND UPON APPROVAL BY THE ENGINEER.

GENERAL DEMOLITION & CLEARING NOTES

1. DEMOLITION: IT IS THE INTENT OF THE WORK UNDER THIS CONTRACT TO INCLUDE THE DEMOLITION OF ALL EXISTING SITE FEATURES INCLUDING THEIR UNDERGROUND COMPONENTS AS INDICATED BY THIS DRAWING AND AS REQUIRED IN THE PROJECT SPECIFICATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FULLY REVIEW THE SITE CONDITIONS AND TO CORRELATE THEIR OBSERVATIONS WITH THE PROJECT WORK AND INCLUDE ALL NECESSARY DEMOLITION WHETHER SHOWN OR NOT AND INCLUDE ALL SUCH COSTS IN THE BASE BID.
2. CLEARING: IT IS THE INTENT OF THE WORK UNDER THIS CONTRACT TO INCLUDE ALL CLEARING NECESSARY TO COMPLETE ALL PROJECT WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FULLY REVIEW THE SITE CONDITIONS AND TO CORRELATE THEIR OBSERVATIONS WITH PROJECT WORK AND INCLUDE ALL NECESSARY CLEARING WHETHER SHOWN OR NOT AND INCLUDE ALL SUCH COSTS IN THE BASE BID.
3. CONTRACTOR TO PROTECT ALL EXISTING ONSITE AND ADJACENT UTILITIES, UNLESS OTHERWISE SPECIFICALLY INDICATED.
4. PRIOR TO CONSTRUCTION, CONTRACTOR TO ENSURE ALL PREVENTIVE TESC MEASURES ARE IN PLACE AND MAINTAINED TO CONTAIN SITE RUNOFF AND NOT ALLOW DISCHARGE TO ADJACENT PROPERTIES OR THE THEA FOSS WATERWAY IN ACCORDANCE WITH THE PROJECT SWPPP, CONSTRUCTION GENERAL STORMWATER PERMIT, AND PROJECT SPECIFICATIONS.
5. CONTRACTOR SHALL DISPOSE OF THE DEMOLISHED MATERIALS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
6. CONTRACTOR TO REMOVE AND HAUL DEMOLISHED MATERIALS TO ENGINEER APPROVED DISPOSAL FACILITIES.
7. CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EXISTING UTILITIES. IF CONFLICTS EXIST, THEN CONTRACTOR SHALL NOTIFY ENGINEER.
8. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETELY COORDINATE UTILITY DEMOLITION WITH NEW CONSTRUCTION.
9. CONTRACTOR SHALL PROTECT ALL VEGETATION AND TREES BEYOND THE CLEARING LIMITS FROM CONSTRUCTION DAMAGE.
10. CONTRACTOR SHALL COORDINATE PHASE AND SCHEDULE ALL PROJECT WORK TO MAINTAIN ACCESS TO BERG SCAFFOLDING OFFICE BUILDING AND MAIN STORAGE AREA THROUGHOUT ALL PROJECT WORK. ANY WORK THAT REQUIRES OBSTRUCTION OF ACCESS TO BERG SCAFFOLDING SHALL BE PERFORMED AND COMPLETED OUTSIDE OF BERG SCAFFOLDING HOURS OF OPERATION.
11. EXISTING ASPHALT ACCESS ROAD AND GRAVEL BASE COURSE MATERIAL TO BE DEMOLISHED AND REMOVED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
12. A MATERIAL MANAGEMENT AREA OR AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND PLAN DETAIL 7 SHEET C2.1. THIS AREA OR AREAS WILL BE USED TO TEMPORALLY STOCKPILE MATERIALS FOR DISPOSAL CHARACTERIZATION SAMPLING ACTIVITIES IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
13. CONSTRUCTION RELATED NOISE WILL BE LIMITED TO CITY-DESIGNATED WORK HOURS.
14. A PROJECT WATER MANAGEMENT SYSTEM SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS FOR USE IN TEMPORARY. STORAGE AND TREATMENT OF ALL PROJECT WATER PRODUCED OR RECOVERED DURING ALL PROJECT WORK. ALL TREATED PROJECT WATER WILL BE DISCHARGED TO THE CITY OF TACOMA SANITARY SEWER IN ACCORDANCE WITH A SPECIAL DISCHARGE AUTHORIZATION PERMIT.
15. CONSTRUCT TEMPORARY INTERCEPTOR SWALE, SANDBAG CHECK DAM, AND/OR TEMPORARY SEDIMENT TRAPS AS NECESSARY TO CONTAIN ALL PROJECT AREA RUNOFF. RUNOFF COLLECTED IN THE SEDIMENT TRAP(S) WILL BE ROUTED TO THE PROJECT WATER MANAGEMENT SYSTEM.
16. ANY DAMAGE TO ADJACENT RIGHT-OF-WAYS AND PROPERTY IS AT THE EXPENSE OF THE CONTRACTOR. THE CONTRACTOR WILL RESTORE ADJACENT ROWS AND PROPERTY AT ITS SOLE EXPENSE IF DAMAGE OCCURS.
17. CONTRACTOR SHALL NOT ACCESS, STORE MATERIAL OR EQUIPMENT, OR PERFORM WORK BELOW ORDINARY HIGH WATER.

DEMOLITION KEY NOTES

1. PROTECT EXISTING UTILITY.
2. PROTECT EXISTING UTILITY POLE.
3. DEMOLISH CONCRETE SURFACES, FOUNDATIONS, AND FOOTINGS IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
4. REMOVE ECOLOGY BLOCKS AND REUSE FOR STOCKPILED MATERIAL MANAGEMENT AREAS.
5. CLEAR VEGETATION, DEBRIS, TRASH, REMNANT ASPHALT PAVEMENT, AND CONCRETE.
6. DEMOLISH 3' WIRE FENCE.
7. PROTECT EXISTING BUILDING.
8. DEMOLISH ASPHALT PAVEMENT.
9. REMOVE EXISTING CHAINLINK FENCE AS NEEDED TO COMPLETE PROJECT WORK. SALVAGE ALL FENCING, GATE HARDWARE AND FENCING HARDWARE TO RE-USED DURING SITE RESTORATION.
10. PROTECT EXISTING CONCRETE ENTRANCE.
11. DECOMMISSION MONITORING WELL IN ACCORDANCE WITH WAC 173-160.
12. INSTALL FILTER FENCE, WESTERN PROPERTY BOUNDARY PROTECTION BARRIER, INTERCEPTOR SWALE, CHECK DAMS, AND SEDIMENT TRAPS AD NEEDED TO CONTAIN ALL PROJECT WATER.
13. INSTALL TEMPORARY ASPHALT BARRIER ACROSS ASPHALT ACCESS ROAD, AS NECESSARY TO CONTAIN SURFACE WATER RUNOFF.
14. REMOVE EXISTING COTTONWOOD TREES IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
15. PROTECT EXISTING VAULT.

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Reference: Base CAD drawing provided by AHBL, dated 08-26-2011.

20 0 20 40
Scale in Feet

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BY
DATE
FIELD BOOKS

DATE	SCALE
01/26/2012	AS NOTED
DESIGNED	CHECKED
NER/IHW	CLB
DRAWN	PROJECT NAME
SCY	10751-002-01
DRAWING NAME	
1075100201_C2.0	

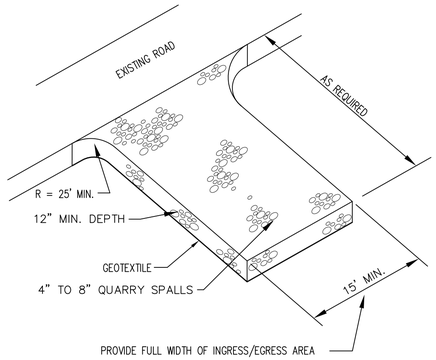
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CITY OF TACOMA
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Tacoma, Washington
Site Preparation and Demolition Plan

SHEET NO. C2.0
SHEET 3 OF 16

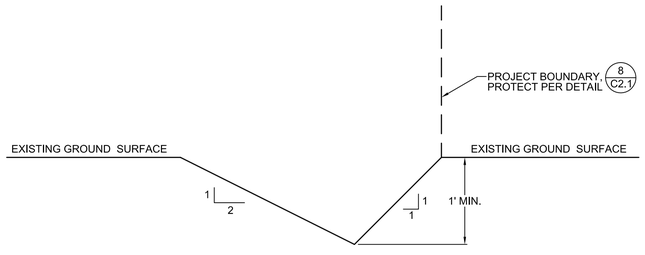
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CONSTRUCTION ENTRANCE NOTES

1. MATERIAL SHALL BE 4-INCH TO 8-INCH QUARRY SPALLS AND MAY BE TOP-DRESSED WITH 1-INCH TO 3-INCH ROCK. (WSDOT STANDARD SPECIFICATIONS, SECTION 8-15.)
2. THE ROCK PAD SHALL BE AT LEAST 12 INCHES THICK AND AS LONG AS REGULATED BY THE ENGINEER. WIDTH SHALL BE THE FULL WIDTH OF THE VEHICLE INGRESS AND EGRESS AREA.
3. ADDITIONAL ROCK SHALL BE ADDED PERIODICALLY TO MAINTAIN PROPER FUNCTION OF THE PAD.
4. IF THE PAD DOES NOT ADEQUATELY REMOVE THE MUD FROM THE VEHICLE WHEELS, THE WHEELS SHALL BE HOSED OFF BEFORE THE VEHICLE ENTERS A PAVED STREET. THE WASHING SHALL BE DONE ON AN AREA COVERED WITH CRUSHED ROCK AND WASH WATER SHALL DRAIN TO THE WATER MANAGEMENT SYSTEM.
5. GEOTEXTILE SHALL MEET THE FOLLOWING: GRAB TENSILE STRENGTH 200 PSI MIN. GRAB TENSILE LONGATION 30% MAX. MULLEN BURST STRENGTH 400 PSI MIN. AOS 2-45(U.S. STANDARD SIEVE)

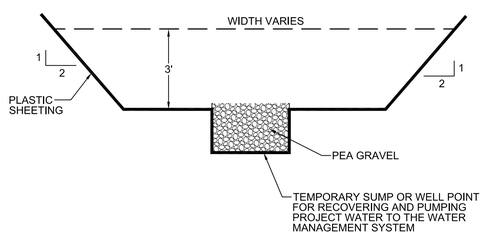
1 C2.0 CONSTRUCTION ENTRANCE
(NOT TO SCALE)



4 C2.0 TEMPORARY INTERCEPTOR SWALE
(NOT TO SCALE)

NOTES

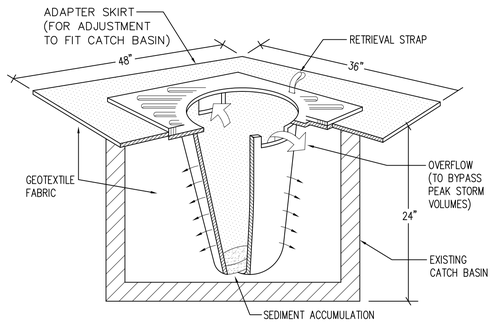
1. INTERCEPTOR SWALE(S) SHALL BE CONSTRUCTED TO CAPTURE AND CONTAIN ALL PROJECT SURFACE WATER, SWALES SHALL BE LOCATED ALONG THE PERIMETER BOUNDARY LIMITS.
2. SANDBAG CHECK DAMS SHALL BE INSTALLED WITHIN SWALES TO CONTROL SEDIMENTATION AND WATER FLOWS.
3. ALL SWALES SHALL BE ROUTED TO TEMPORARY SEDIMENT TRAP(S), AS NEEDED, TO CONTROL AND CONTAIN ALL PROJECT SURFACE WATER.



NOTES

1. TRAP MAY BE FORMED BY BERM OR BY PARTIAL OR COMPLETE EXCAVATION.
2. SEDIMENT TRAPS, ALONG WITH OTHER PERIMETER CONTROLS, SHALL BE INSTALLED BEFORE ANY LAND DISTURBANCE TAKES PLACE IN THE DRAINAGE AREA.
3. SEDIMENT SHALL BE REMOVED FROM THE TRAP BEFORE IT REACHES 1-FOOT IN DEPTH.
4. ANY DAMAGE TO THE TRAP EMBANKMENTS OR SLOPE SHALL BE REPAIRED IMMEDIATELY.

6 C2.0 TEMPORARY SEDIMENT TRAP DETAIL
(NOT TO SCALE)



#3003 SEDIMENT ONLY

PROVIDE CATCH BASIN SEDIMENT PROTECTION WITH STREAMGUARD BASIN INSERT #3003, FROM FOSS ENVIRONMENTAL
7440 W. MARGINAL WAY S.
SEATTLE, WA 98108-4141
PHONE: 1-800-909-3677

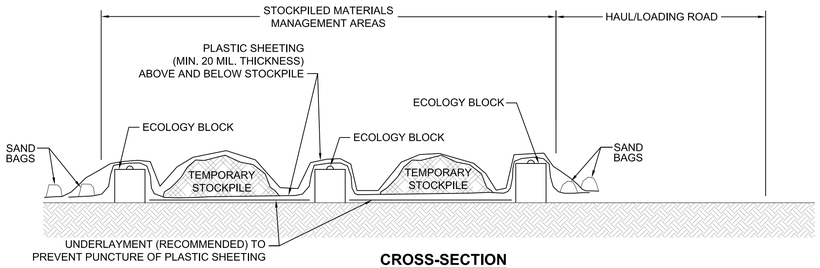
2 C2.0 INLET SEDIMENT PROTECTION
(NOT TO SCALE)

SANDBAG CHECK DAM NOTES

1. SANDBAG CHECK DAMS SHALL BE 1' HIGH IN THE CENTER AND A MINIMUM OF 0.5' HIGHER ON THE SIDES.
2. CHECK DAMS SHALL BE TOED IN AT THE BASE A MINIMUM OF 0.5' TO PREVENT EROSION.
3. CHECK DAMS SHALL BE CONSTRUCTED IN SUCH A MANNER THAT THE SANDBAGS ARE FIRMLY PLACED WITH A MINIMUM OF SPACE BETWEEN BAGS.
4. CHECK DAMS SHOULD BE PLACED PERPENDICULAR TO THE FLOW OF WATER.
5. THE MAXIMUM SPACING BETWEEN THE DAMS SHALL BE SUCH THAT THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE TOP OF THE DOWNSTREAM DAM.
6. KEEP THE MAXIMUM HEIGHT AT 2 FEET AT THE CENTER OF THE DAM.
7. SANDBAG CHECK DAMS SHALL BE CONSTRUCTED OF APPROPRIATELY SIZED BAGS. THE BAGS MUST BE PLACED BY HAND OR BY MECHANICAL MEANS TO ACHIEVE COMPLETE COVERAGE OF THE DITCH OR SWALE AND TO ENSURE THAT THE CENTER OF THE DAM IS LOWER THAN THE EDGES. THE BAGS USED MUST BE LARGE ENOUGH TO STAY IN PLACE GIVEN THE EXPECTED DESIGN FLOW THROUGH THE CHANNEL.
8. CHECK DAMS SHALL BE MONITORED FOR PERFORMANCE AND SEDIMENT ACCUMULATION DURING AND AFTER EACH RUNOFF PRODUCING RAINFALL. SEDIMENT SHALL BE REMOVED BEFORE IT REACHES ONE HALF THE SUMP DEPTH.

DITCH SLOPE	CHECK DAM SPACING
0 – 5%	150 FEET
5 – 10%	100 FEET
10%	50 FEET

5 C2.0 SANDBAG CHECK DAM DETAIL
(NOT TO SCALE)

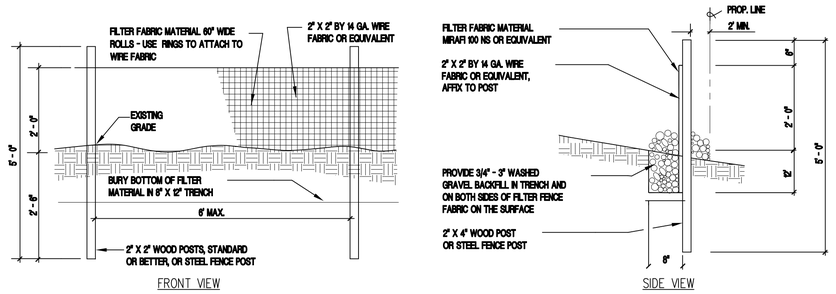


CROSS-SECTION

NOTES

1. STOCKPILED MATERIAL WILL BE COVERED AND SECURED FROM WIND, RAIN, AND OTHER DISTURBANCES AT ALL TIMES EXCEPT DURING ACTIVE MATERIAL LOADING AND UNLOADING.
2. EROSION CONTROL MEASURES, AS DESCRIBED ON SHEET C2.0 SHALL BE IN PLACE AT ALL TIMES DURING USE OF STOCKPILED MATERIAL MANAGEMENT AREAS.
3. WATER COLLECTED WITHIN THE AREAS MUST BE CONTAINED AS DESCRIBED IN THE PROJECT SPECIFICATIONS AND SWPPP. CONTRACTOR SHALL REMOVE WATER WITHIN THE AREAS BY PUMPING TO THE PROJECT WATER MANAGEMENT SYSTEM FOR TREATMENT AND ANALYSIS PRIOR TO DISPOSAL IN ACCORDANCE WITH THE SPECIAL DISCHARGE AUTHORIZATION. CONTRACTOR SHALL BE RESPONSIBLE FOR WATER COLLECTION IN THE STOCKPILED MATERIAL MANAGEMENT AREAS.

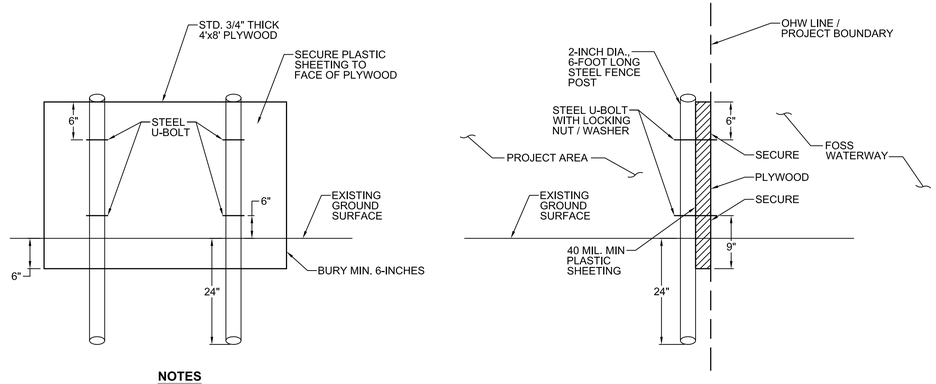
7 C2.0 STOCKPILED MATERIALS MANAGEMENT AREAS DETAIL
(NOT TO SCALE)



FILTER FABRIC FENCE NOTES

1. FILTER FABRIC FENCE SHALL BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY FASTENED AT BOTH ENDS TO POSTS.
2. POST SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 30 INCHES).
3. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 8 INCHES WIDE AND 12 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER. THIS TRENCH SHALL BE BACKFILLED WITH WASHED GRAVEL.
4. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES OR HOG RINGS. THE WIRE MESH SHALL EXTEND INTO THE TRENCH A MINIMUM OF 4 INCHES THE FILTER FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 24 INCHES.
5. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND NOT EXTEND MORE THAN 24 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
6. WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING IS USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISIONS OF ABOVE NOTES APPLYING.
7. FILTER FABRIC FENCES SHALL NOT BE REMOVED BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
8. FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
9. SILT FENCES WILL BE INSTALLED PARALLEL TO ANY SLOPE CONTOURS.
10. INSTALL DOWN SLOPE OF EXPOSED AREAS.
11. DO NOT DRIVE OVER OR FILL OVER SILT FENCES.

3 C2.0 FILTER FABRIC FENCE
(NOT TO SCALE)



NOTES

1. PLYWOOD SHALL BE OVERLAPPED A MINIMUM OF 3-INCHES BETWEEN EACH PLYWOOD SHEET. PLYWOOD SHALL BE BURIED A MINIMUM OF 6-INCHES BELOW GROUND SURFACE.
2. ALL PROJECT WATER, DEBRIS, SOIL OR ANY OTHER PROJECT-RELATED MATERIALS WILL BE CONTAINED BY THIS WESTERN BOUNDARY PROTECTION BARRIER. ANY DAMAGE OR RELEASE BEYOND THIS BARRIER WILL BE AT THE CONTRACTOR'S SOLE EXPENSE.
3. THIS BARRIER SHALL REMAIN IN PLACE DURING ALL PROJECT WORK AND UNTIL THE SITE IS FULLY STABILIZED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, SWPPP AND RESTORATION PLAN.
4. THE CONTRACTOR SHALL PREVENT ALL PROJECT WORK FROM DAMAGING THIS BARRIER DURING ALL PROJECT WORK.
5. WRAP AND SECURE THE PLASTIC SHEETING OVER THE ENTIRE PLYWOOD FACE.

8 C2.0 WESTERN PROJECT BOUNDARY PROTECTION BARRIER DETAIL
(NOT TO SCALE)

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DATE 01/26/2012 | SCALE AS NOTED
DESIGNED NER/IHW | CHECKED CLB
DRAWN SCY | PROJECT NAME 10751-002-01
DRAWING NAME 1075100201_C2.1

1/26/12 CHRISTOPHER LEWIS BAILEY STATE OF WASHINGTON 39963 REGISTERED PROFESSIONAL ENGINEER

CONSTRUCTION DIVISION

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
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SHEET NO. C2.1
SHEET 4 OF 16

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GENERAL EROSION CONTROL NOTES

1. THE IMPLEMENTATION OF THESE TESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE TESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION / LANDSCAPING IS ESTABLISHED.
2. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING ALL PROJECT WORK, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF ALL PROJECT WORK.
3. THE TESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER IS CONTAINED ONSITE.
4. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE TESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER IS CONTAINED ONSITE.
5. THE TESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
6. THE TESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A WEEK OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
7. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN SEDIMENT TRAP. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT-LADEN WATER INTO THE STORMWATER SYSTEM.
8. A STABILIZED CONSTRUCTION ENTRANCE SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF ALL PROJECT WORK.
9. TEMPORARY MATERIAL STORAGE AREAS SHOULD BE LOCATED AWAY FROM VEHICULAR TRAFFIC, NEAR THE CONSTRUCTION ENTRANCE, AND AWAY FROM WATERWAYS OR STORM DRAINS.
10. MATERIAL SAFETY DATA SHEETS (MSDS) SHOULD BE SUPPLIED FOR ALL MATERIALS STORED. CHEMICALS SHOULD BE KEPT IN THEIR ORIGINAL LABELED CONTAINERS.
11. HAZARDOUS MATERIAL STORAGE ON-SITE SHOULD BE MINIMIZED.
12. HAZARDOUS MATERIALS SHOULD BE HANDLED AS INFREQUENTLY AS POSSIBLE.
13. DURING THE WET WEATHER SEASON (OCT 1 - APRIL 30), CONSIDER STORING MATERIALS IN A COVERED AREA.
14. MATERIALS SHOULD BE STORED IN SECONDARY CONTAINMENTS, SUCH AS EARTHEN DIKE, HORSE TROUGH, OR EVEN A CHILDREN'S WADING POOL FOR NON-REACTIVE MATERIALS SUCH AS DETERGENTS, OIL, GREASE, AND PAINTS. SMALL AMOUNTS OF MATERIAL MAY BE SECONDARILY IN "BUS BOY" TRAYS OR CONCRETE MIXING TRAYS.
15. DO NOT STORE CHEMICALS, DRUMS, OR BAGGED MATERIALS DIRECTLY ON THE GROUND. PLACE THESE ITEMS ON A PALLET AND, WHEN POSSIBLE, IN SECONDARY CONTAINMENT.

SECONDARY CONTAINMENT PRACTICES

1. LIQUIDS, PETROLEUM PRODUCTS, AND SUBSTANCES LISTED IN 40 CFR PARTS 110, 117, OR 302 SHALL BE STORED IN APPROVED CONTAINERS AND DRUMS AND SHALL NOT BE OVERFILLED. CONTAINERS AND DRUMS SHALL BE STORED IN TEMPORARY SECONDARY CONTAINMENT FACILITIES.
2. TEMPORARY SECONDARY CONTAINMENT FACILITIES SHALL PROVIDE FOR A SPILL CONTAINMENT VOLUME ABLE TO CONTAIN PRECIPITATION FROM A 25 YEAR, 24 HOUR STORM EVENT, PLUS 10% OF THE TOTAL ENCLOSED CONTAINER VOLUME OF ALL CONTAINERS, OR 110% OF THE CAPACITY OF THE LARGEST CONTAINER WITHIN ITS BOUNDARY, WHICHEVER IS GREATER.
3. TEMPORARY SECONDARY CONTAINMENT FACILITIES SHALL BE IMPERVIOUS TO THE MATERIALS STORED THEREIN FOR A MINIMUM CONTACT TIME OF 72 HOURS.
4. TEMPORARY SECONDARY CONTAINMENT FACILITIES SHALL BE MAINTAINED FREE OF ACCUMULATED RAINWATER AND SPILLS. IN THE EVENT OF SPILLS OR LEAKS, ACCUMULATED RAINWATER AND SPILLS SHALL BE COLLECTED AND PLACED INTO DRUMS. THESE LIQUIDS SHALL BE HANDLED AS HAZARDOUS WASTE UNLESS TESTING DETERMINES THEM TO BE NON-HAZARDOUS.
5. SUFFICIENT SEPARATION SHOULD BE PROVIDED BETWEEN STORED CONTAINERS TO ALLOW FOR SPILL CLEANUP AND EMERGENCY RESPONSE ACCESS.
6. DURING THE WET WEATHER SEASON (OCT 1 - APRIL 30), EACH SECONDARY CONTAINMENT FACILITY SHALL BE COVERED DURING NON-WORKING DAYS, PRIOR TO AND DURING RAIN EVENTS.
7. KEEP MATERIAL STORAGE AREAS CLEAN, ORGANIZED AND EQUIPPED WITH AN AMPLE SUPPLY OF APPROPRIATE SPILL CLEAN-UP MATERIAL (MINIMUM 3 SPILL KIT).
8. SPILL KITS SHOULD INCLUDE, AT A MINIMUM:
   - 1-WATER RESISTANT NYLON BAG
   - 3-OIL ABSORBENT SOCKS 3"x4'
   - 2-OIL ABSORBENT SOCKS 3"x10'
   - 12-OIL ABSORBENT SOCKS 17"x19"
   - 1-PAIR SPLASH RESISTANT GOGGLES
   - 3-PAIR NITRILE GLOVES
   - 10-DISPOSABLE BAGS WITH TIES
   - INSTRUCTIONS

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DRAWING NAME	1075100201_C2.2	

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CHRISTOPHER LEWIS BAILEY
STATE OF WASHINGTON
22963
REGISTERED
PROFESSIONAL ENGINEER

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SHEET 5 OF 16

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LEGEND

- MW-2 — LOCATED MONITORING WELL
- MW-1 — UNLOCATED MONITORING WELL
- BOLLARD
- SIGN AS NOTED
- STORM CLEANOUT
- STORM CATCH BASIN
- FSTORM MANHOLE
- GAS VALVE
- GUY ANCHOR
- UTILITY POWER POLE
- JUNCTION BOX
- LUMINAIRE
- COMMUNICATIONS MANHOLE
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- ADJUSTED MANHOLE
- ABANDONED MANHOLE
- FENCE GATE
- WATER METER
- WATER MANHOLE
- WATER VALVE
- DECIDUOUS TREE AS NOTED
- GATE POST
- APPROXIMATE LOCATION OF NINE 55-GALLON STEEL DRUMS
- QWEST OT — QWEST OVERHEAD COMMUNICATION
- QWEST BT — QWEST BURIED CABLE LINE
- ST — STORM SEWER LINE
- BP — BURIED POWER LINE
- BT — BURIED CABLE LINE
- SS — SANITARY SEWER LINE
- G — GAS LINE
- W — WATER LINE
- T — COMMUNICATION LINE
- P — POWER LINE
- D — STORM LINE
- OP — OVERHEAD POWER
- OT — OVERHEAD COMMUNICATION
- X — FENCE
- PARCEL BOUNDARY
- PROJECT BOUNDARY
- CONTRACTOR SHALL NOT OPERATE IN THIS AREA
- PARCEL 8950001791 NOT FOR CONSTRUCTION
- AREA OF VEGETATION, DEBRIS, TRASH, REMNANT ASPHALT PAVEMENT, CONCRETE AND WOOD
- REMEDIAL EXCAVATION AREA (REA)
- UTILITY CORRIDOR EXCAVATION AREA (UCA)
- REA 1 — REMEDIAL EXCAVATION AREA 1
- UCA 1 — UTILITY CORRIDOR EXCAVATION AREA 1

EXCAVATION AREA NOTES

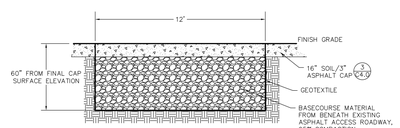
1. THE CONTRACTOR SHALL PHASE AND STAGE EXCAVATION OF REMEDIAL EXCAVATION AREAS (REA 1 AND REA 2) AND UTILITY CORRIDOR EXCAVATION AREAS (UCA 1, UCA 2, AND UCA 3) SO AS TO MEET OR EXCEED THE PROJECT SCHEDULE.
2. THE CONTRACTOR SHALL PERFORM SITE PREPARATION AND DEMOLITION ACTIVITIES IN ACCORDANCE WITH SECTION 10 AND 11 OF SPECIFICATIONS PRIOR TO PERFORMING REMEDIAL EXCAVATION IN REA 1, REA 2, UCA 1, UCA 2, AND UCA 3.
3. THE CONTRACTOR SHALL INITIALLY EXCAVATE REA 1 TO THE HORIZONTAL LIMITS SHOWN ON SHEET C-3 AND TO A DEPTH OF 4 FEET BELOW EXISTING GROUND SURFACE AND NOTIFY THE ENGINEER.
4. THE CONTRACTOR SHALL INITIALLY EXCAVATE REA 2 TO THE HORIZONTAL LIMITS SHOWN ON SHEET C-3 AND TO A DEPTH OF 2 FEET BELOW EXISTING GROUND SURFACE AND NOTIFY THE ENGINEER.
5. REMEDIAL EXCAVATION SIDEWALLS AT REA 1 AND REA 2 SHALL NOT INITIALLY BE SLOPED UNLESS REQUIRED TO MEET WISHA OR OSHA REQUIREMENTS. EXCAVATION SHALL PROCEED LATERALLY AND/OR DEEPER AWAY FROM THE INITIAL LIMITS SHOWN ON SHEET C-3 AT THE DIRECTION OF THE ENGINEER BASED ON FIELD SCREENING AND CHEMICAL ANALYTICAL RESULTS.
6. THE CONTRACTOR SHALL COMPLETE EXCAVATION AND BACKFILL OF REA 1 PRIOR TO INITIATING EXCAVATION OF UCA 1, BACKFILL USED IN REA 1 MAY BE REUSED AS BACKFILL IN UCA 1.
7. THE CONTRACTOR SHALL INITIALLY EXCAVATE UCA 1, UCA 2, AND UCA 3 SHALL NOT INITIALLY BE SLOPED UNLESS REQUIRED TO MEET WISHA OR OSHA REQUIREMENTS, TO THE HORIZONTAL AND VERTICAL LIMITS SHOWN ON SHEET C-3 AND NOTIFY THE ENGINEER.
8. EXCAVATION SIDEWALLS AT UCA 1, UCA 2, AND UCA 3 SHALL NOT INITIALLY BE SLOPED UNLESS REQUIRED TO MEET WISHA OR OSHA REQUIREMENTS. EXCAVATION SHALL PROCEED DEEPER AND/OR LATERALLY AWAY FROM THE INITIAL LIMITS SHOWN ON SHEET C-3 AT THE DIRECTION OF THE ENGINEER BASED ON VISUAL OBSERVATIONS INDICATING THE PRESENCE OF MATERIALS OR CONDITIONS THAT MAY AFFECT UTILITY CONSTRUCTION AND OPERATION.
9. NO SOIL EXCAVATION SHALL EXTEND BEYOND THE PROJECT BOUNDARIES SHOWN ON SHEET C-1. SLOPING OF EXCAVATION SIDEWALLS AND/OR SHORING SHALL BE USED, AS NECESSARY, TO COMPLETE EXCAVATION, ALLOW FOR CONFIRMATION SAMPLING, AND MINIMIZE INFILTRATION OF WATER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN AND CONSTRUCTION OF SHORING SYSTEMS.
10. THE CONTRACTOR SHALL REMOVE THE MATERIAL EXCAVATED FROM REA 1, REA 2, UCA 1, UCA 2, AND UCA 3 AND PLACE THE MATERIAL IN SEPARATE STOCKPILES WITHIN THE STOCKPILES MATERIALS MANAGEMENT AREAS IN ACCORDANCE WITH SECTION 14 OF THE SPECIFICATIONS. THE STOCKPILED MATERIALS MANAGEMENT AREAS SHALL BE CONSTRUCTED AS SHOWN ON SHEET C-2.1.
11. AREAS USED TO TEMPORARILY STOCKPILE EXCAVATED MATERIALS SHALL BE LOCATED WITHIN THE PROJECT BOUNDARIES SHOWN ON SHEET C-1.
12. STOCKPILED SOIL WILL BE CHARACTERIZED BY THE ENGINEER. SOME STOCKPILED SOILS MAY BE DETERMINED TO BE HAZARDOUS WASTE. HAZARDOUS WASTE MUST BE HANDLED IN ACCORDANCE WITH DANGEROUS WASTE REGULATIONS.
13. STOCKPILES MUST BE MAINTAINED DURING CHARACTERIZATION OF THE STOCKPILED MATERIAL FOR DISPOSAL. EXCAVATIONS MUST BE MAINTAINED OPEN UNTIL BACKFILLING IS APPROVED BY THE ENGINEER.
14. ALL UTILITIES AND OTHER STRUCTURES REQUIRING REMOVAL TO COMPLETE REMEDIAL EXCAVATIONS SHALL BE RESTORED TO ORIGINAL CONDITION.
15. EXCAVATIONS FOR REA 1 AND REA 2 SHALL BE BACKFILLED WITH GRAVEL BASE COURSE MATERIAL REMOVED FROM BENEATH THE EXISTING ASPHALT ROAD AND CLEAN IMPORT MATERIAL IN ACCORDANCE WITH SECTION 12 OF THE SPECIFICATIONS.
16. EXCAVATIONS FOR UCA 1, UCA 2, AND UCA 3 SHALL BE BACKFILLED WITH IMPORT MATERIAL AND GRAVEL BASE COURSE MATERIAL REMOVED FROM BENEATH THE EXISTING ASPHALT ROAD IN ACCORDANCE WITH SECTION 13 OF THE SPECIFICATIONS.
17. IMPORTED BACKFILL MATERIAL SOURCES WILL BE INSPECTED AND TESTING OF IMPORTED BACKFILL MATERIAL WILL BE PERFORMED IN ACCORDANCE WITH COMPLIANCE MONITORING PLAN (CMP). INSPECTION OF BACKFILL SOURCES AND TESTING OF BACKFILL MATERIALS WILL BE COMPLETED AND APPROVED BY THE ENGINEER PRIOR TO THE CONTRACTOR BRINGING THE IMPORTED MATERIAL ONSITE.
18. REA 1, REA 2, UCA 1, UCA 2, AND UCA 3 SHALL BE BACKFILLED TO THE GRADES SHOWN ON SHEETS C-4 THROUGH C-4.4.
19. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES TO STRUCTURES RESULTING FROM EXCAVATION ACTIVITIES.

PROJECT WATER MANAGEMENT NOTES

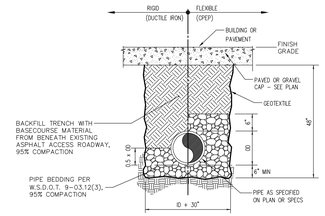
20. THE CONTRACTOR SHALL PREPARE A WATER MANAGEMENT PLAN FOR SUBMITTAL TO THE OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO MOBILIZATION. THE PLAN WILL IDENTIFY THE EQUIPMENT TO BE USED TO CONTROL, COLLECT, TRANSFER, AND TREAT WATER GENERATED AS PART OF PROJECT WORK INCLUDING EXCAVATION ACTIVITIES.
21. THE CONTRACTOR SHALL INSTALL DEWATERING EQUIPMENT INCLUDING SUMPS, PUMPS, AND/OR VACUUM WELLPOINTS, AS NEEDED, IF WATER IS ENCOUNTERED WITHIN THE EXCAVATIONS TO DEWATER THE EXCAVATIONS.
22. THE WATER REMOVED FROM THE EXCAVATIONS WILL BE COLLECTED, TREATED, AND DISCHARGED TO THE SANITARY SEWER SYSTEM OPERATED BY THE CITY OF TACOMA. THE DISCHARGE WILL MEET THE REQUIREMENTS OF A SPECIAL AUTHORIZATION DISCHARGE (SAD) PERMIT.
23. THE CONTRACTOR SHALL DISCHARGE TO A CITY MANHOLE IDENTIFIED WITHIN THE SAD PERMIT AND INSTALL AN APPROPRIATE DISCHARGE FLOW MONITORING SYSTEM AT THE CITY MANHOLE.
24. THE ENGINEER WILL PERFORM SAMPLING OF THE TREATED WATER TO CONFIRM COMPLIANCE WITH PERMIT REQUIREMENTS.

SOIL DISPOSAL NOTES

25. MATERIALS EXCAVATED FROM REA 1, REA 2, UCA 1, UCA 2, AND UCA 3 SHALL BE DISPOSED OF OFFSITE AT A PERMITTED LANDFILL APPROVED BY THE ENGINEER.
26. SOIL TRANSPORTATION TRUCKS AND TRAILERS SHALL BE COVERED DURING ALL OFFSITE TRANSPORT.
27. HAZARDOUS/DANGEROUS WASTE AS DEFINED FROM STOCKPILE SAMPLING AND ANALYSIS SHALL BE HANDLED IN ACCORDANCE WITH THE DANGEROUS WASTE REGULATIONS.



1 / C3.0 UTILITY CORRIDOR (UCA 1)
(NOT TO SCALE)



PIPE BEDDING AND BACKFILL FOR & STORM SEWERS (UCA 2 AND 3)
2 / C3.0 (NOT TO SCALE)

20 0 20 40
Scale in Feet

Sheet Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base CAD drawing provided by AHBL, dated 08-26-2011.

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DESIGNED	CHECKED
NER/IHW	CLB
DRAWN	PROJECT NAME
SCY	10751-002-01
DRAWING NAME	
1075100201_C3.0	

1/26/12
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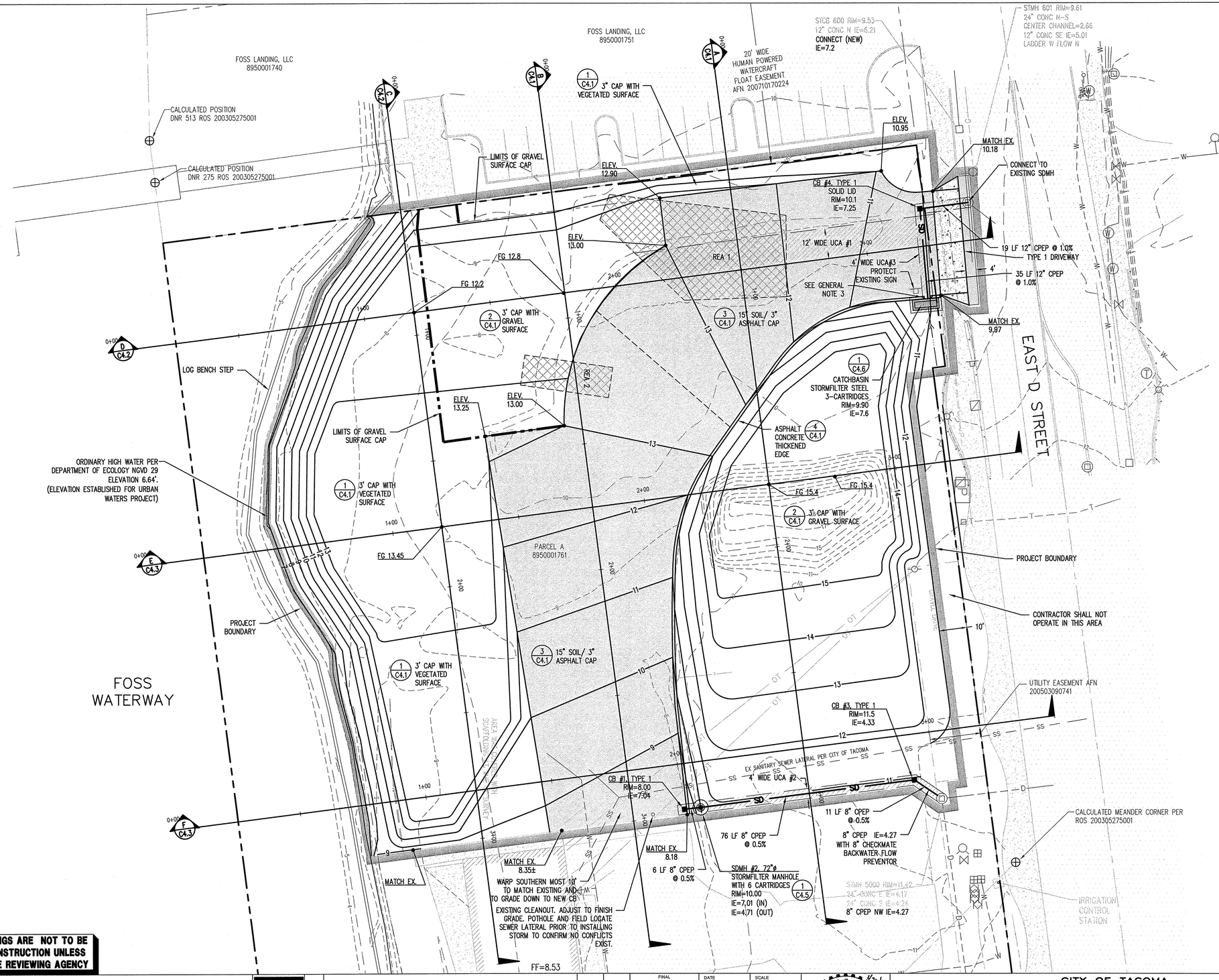
American Plating Site Remediation Project
Tacoma, Washington
Excavation Plan

CONSTRUCTION DIVISION

SHEET NO. C3.0
SHEET 6 OF 16

TACOMAR : SCY

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GRAPHIC SCALE

0 10 20 40 FEET

1" = 20 FEET

LEGEND

- 16" SOIL / 3" ASPHALT CAP (3 C4.1)
- REMEDIAL EXCAVATION AREA (SEE SHEET C3.0)
- UTILITY CORRIDOR AREA (SEE SHEET C3.0)
- STORM DRAIN — SD —
- STORM CATCH BASIN
- STORM FILTER MANHOLE
- STORM FILTER CB
- PROJECT BOUNDARY
- EXISTING CONTOUR
- PROPOSED CONTOUR

GENERAL NOTES

1. CONTRACTOR SHALL VERIFY ALL EXISTING AND PROPOSED GRADES BEFORE COMMENCING WORK.
2. ADJUST EXISTING UTILITIES WITHIN WORK LIMITS TO FINISH GRADE. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY AGENCIES TO RELOCATE EXISTING UTILITIES AS NEEDED TO COMPLETE SITE WORK.
3. CONTRACTOR SHALL PROVIDE A CURB CUT AND FORM ASPHALT TO DIRECT RUNOFF FROM ASPHALT PAVED AREA INTO THE INLET GRATE OF THE STORM FILTER CATCH BASIN.

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TDS	10751-002-01

DRAWING NAME: GRADING AND DRAINAGE PLAN

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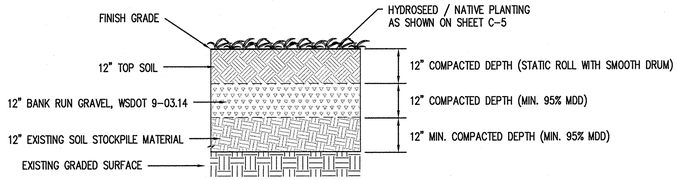
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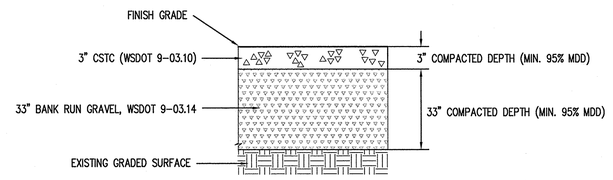
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Tacoma, Washington

Site Grading and Capping Plan

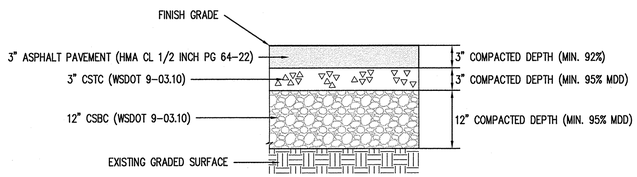
SHEET NO. C4.0
SHEET 7 OF 16



1 3' CAP WITH VEGETATED SURFACE
NOT TO SCALE



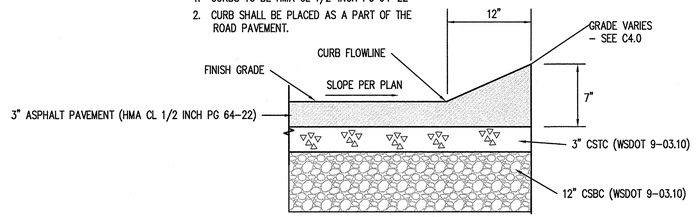
2 3' CAP WITH GRAVEL SURFACE
NOT TO SCALE



3 15" SOIL / 3" ASPHALT CAP
NOT TO SCALE

CAPPING SECTION NOTE: COMPACTED DEPTHS SHOWN. SEE SPECIFICATIONS FOR COMPACTION REQUIREMENTS.

NOTES:
1. CURBS TO BE HMA CL 1/2-INCH PG 64-22
2. CURB SHALL BE PLACED AS A PART OF THE ROAD PAVEMENT.



COMPACTED DEPTHS SHOWN - SEE DETAIL 3 THIS SHEET FOR MORE INFORMATION

4 ASPHALT CONCRETE THICKENED EDGE
NOT TO SCALE

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TDS	10751-002-01
DRAWING NAME	
NOTES AND DETAILS	

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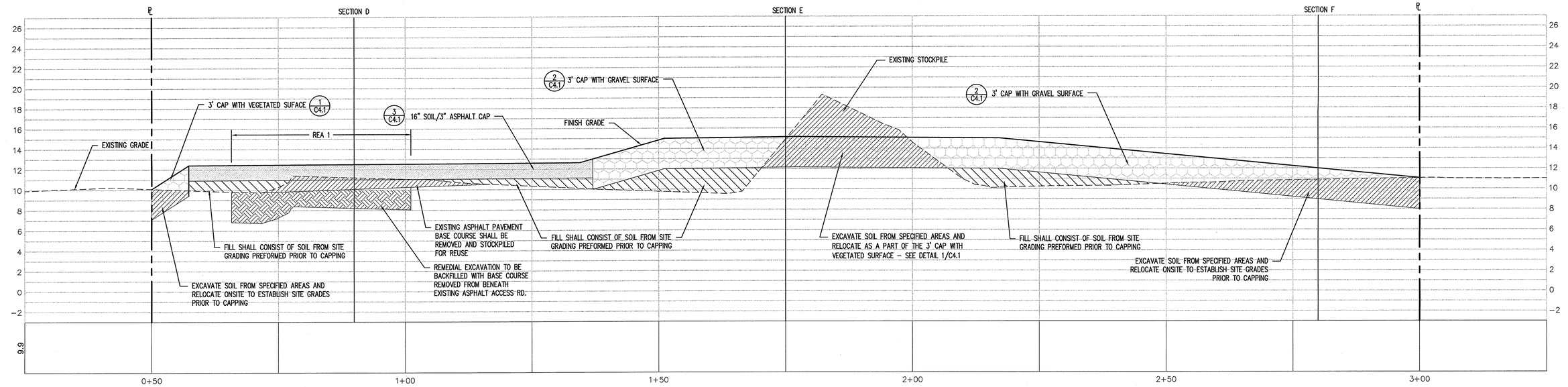
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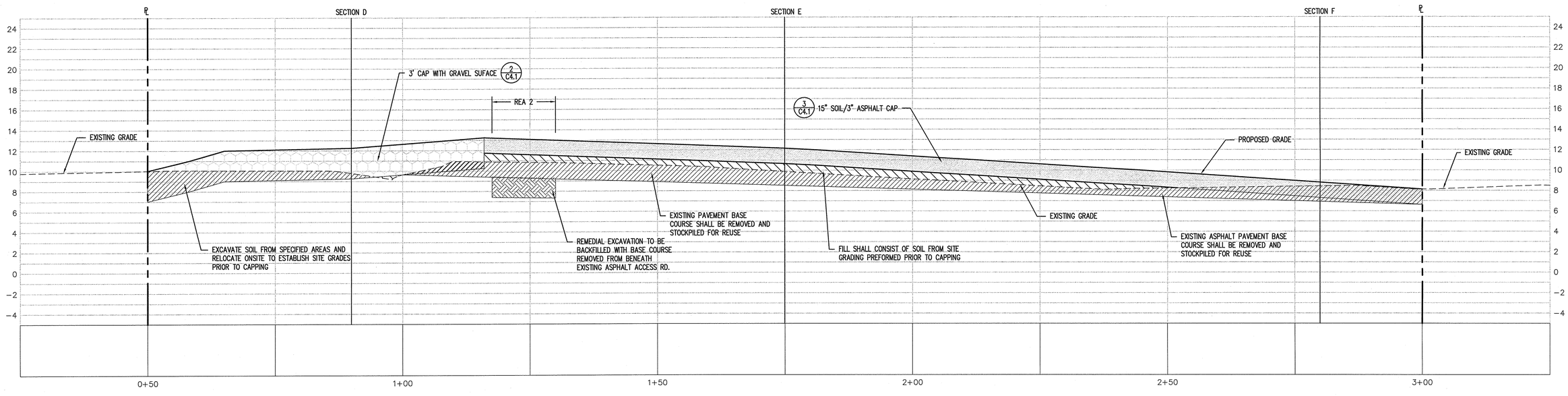
SITE GRADING AND CAPPING DETAILS

SHEET NO. C4.1
SHEET 8 OF 16



A SECTION A-A

SCALE: 1"=10' HORIZONTAL
1"=5' VERTICAL



B SECTION B-B

SCALE: 1"=10' HORIZONTAL
1"=5' VERTICAL

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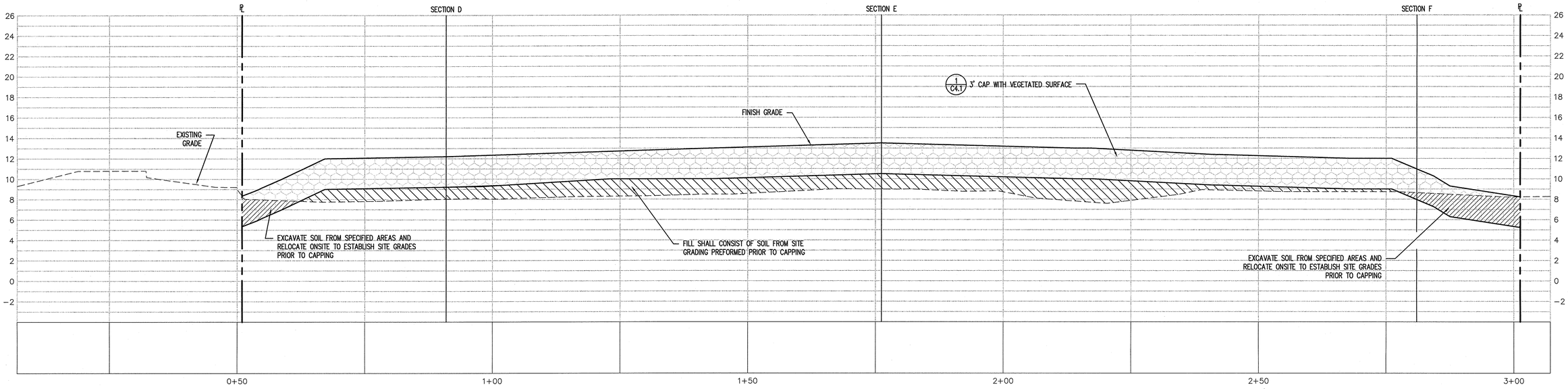
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TDS	10751-002-01
DRAWING NAME	
SITE CROSS SECTIONS	

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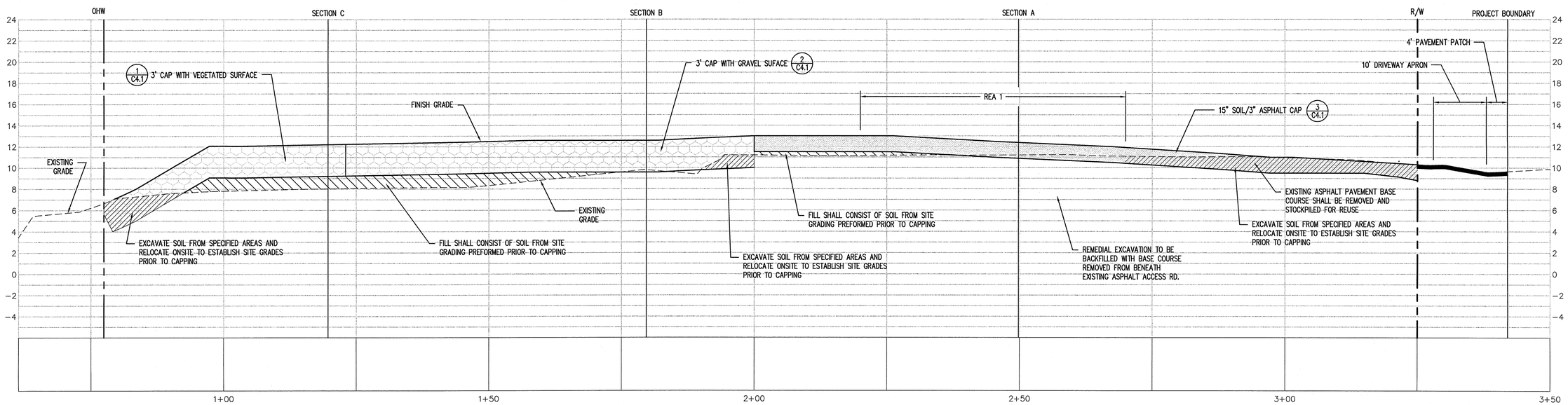
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Site Grading and Capping Sections

SHEET NO. C4.2
SHEET 9 OF 16



C SECTION C-C

SCALE: 1"=10' HORIZONTAL
1"=5' VERTICAL



D SECTION D-D

SCALE: 1"=10' HORIZONTAL
1"=5' VERTICAL

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SITE CROSS SECTIONS	

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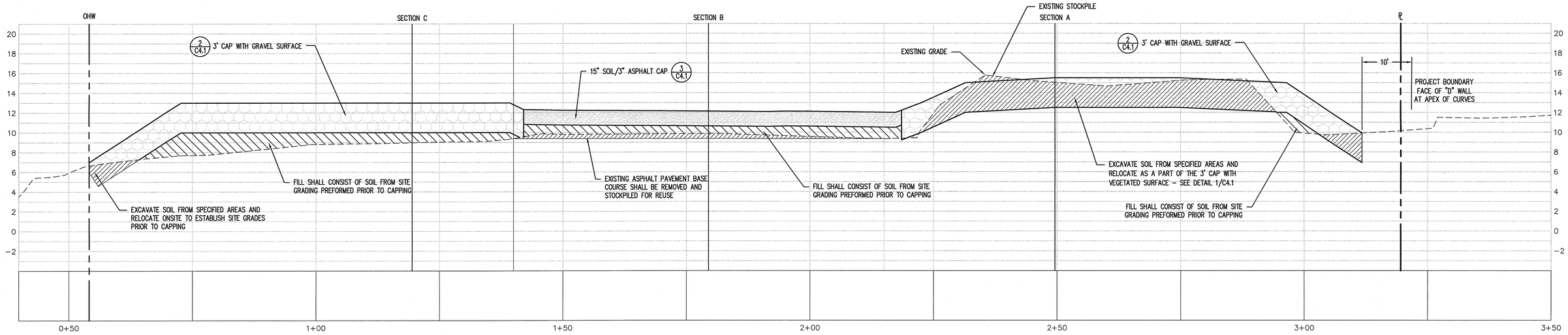
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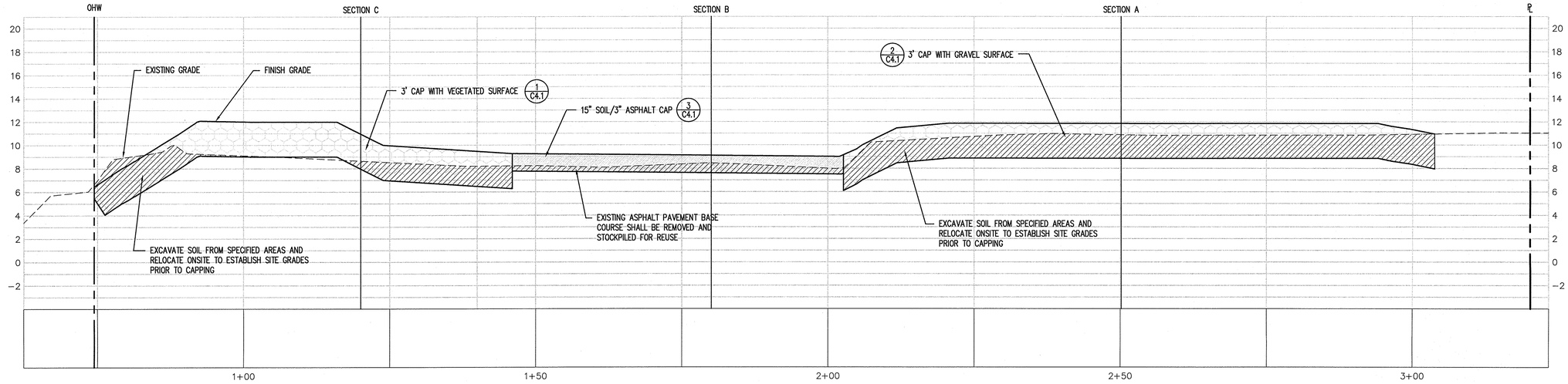
Site Grading and Capping Plan Section

SHEET NO. C4.3
SHEET 10 OF 16



E SECTION E-E

SCALE: 1"=10' HORIZONTAL
1"=5' VERTICAL



F SECTION F-F

SCALE: 1"=10' HORIZONTAL
1"=5' VERTICAL

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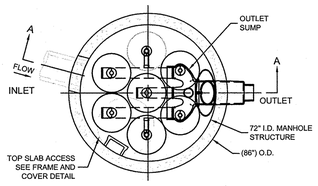
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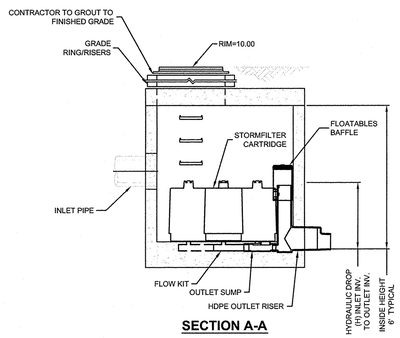
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Site Grading and Capping Plan Section

SHEET NO. C4.4
SHEET 11 OF 16



PLAN VIEW
STANDARD OUTLET RISER
FLOWKIT: 42A



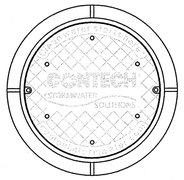
SECTION A-A

STORMFILTER DESIGN NOTES

STORMFILTER TREATMENTCAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (7). VOLUME SYSTEM IS ALSO AVAILABLE WITH MAXIMUM 7 CARTRIDGES. Ø72 MANHOLE STORMFILTER PEAK HYDRAULIC CAPACITY IS 1.5 CFS. IF THE SITE CONDITIONS EXCEED 1.5 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27"		18"		LOW DROP	
RECOMMENDED HYDRAULIC DROP (H)	3.05'		2.3'		1.8'	
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/ft²	1 gpm/ft²	2 gpm/ft²	1 gpm/ft²	2 gpm/ft²	1 gpm/ft²
CARTRIDGE FLOW RATE (gpm)	22.5	11.25	15	7.5	10	5



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			SDMH#2
WATER QUALITY FLOW RATE (cfs)			0.088
PEAK FLOW RATE (cfs)			0.39
RETURN PERIOD OF PEAK FLOW (yrs)			100
# OF CARTRIDGES REQUIRED			6
CARTRIDGE FLOW RATE			7.5
MEDIA TYPE (CSF, PERLITE, ZPG, GAC, PHS)			ZPG
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	7.01	DI	8"
INLET PIPE #2	--	--	--
OUTLET PIPE	4.71	CPEP	8"
UPSTREAM RIM ELEVATION			8.20
DOWNSTREAM RIM ELEVATION			11.24
ANTI-FLOTATION BALLAST	WIDTH		HEIGHT
	--		--

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH CONSTRUCTION PRODUCTS REPRESENTATIVE. www.contech-cpi.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 39 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).

INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET PIPE(S).
5. CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8 INCHES, CONTRACTOR TO REMOVE THE 8 INCH OUTLET STUB AT MOLDED IN CUT LINE. COUPLING BY FERNCO OR EQUAL AND PROVIDED BY CONTRACTOR.
6. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

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SFMH72
STORMFILTER
STANDARD DETAIL

4 SFMH 72" STORMFILTER
NOT TO SCALE

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DATE 1/25/2012 | SCALE AS NOTED
DESIGNED LKG/DN | CHECKED DSG
DRAWN TDS | PROJECT NAME 10751-002-01
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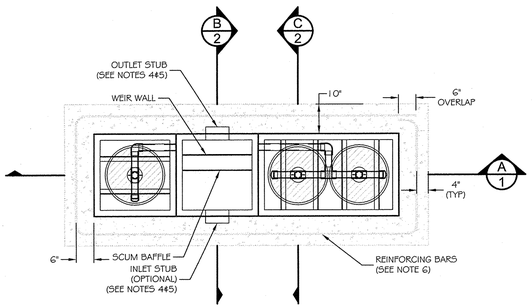
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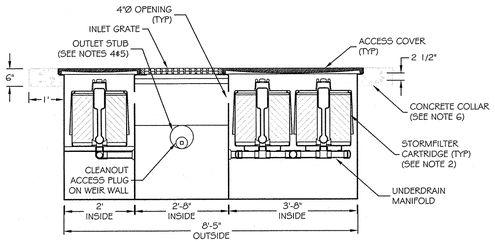
American Plating Site Remediation Project
Tacoma, Washington
Utility Corridor Areas (UCA) Details

SHEET NO. C4.5
SHEET 12 OF 16

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3-CARTRIDGE CATCHBASIN - PLAN VIEW (1 / 1)



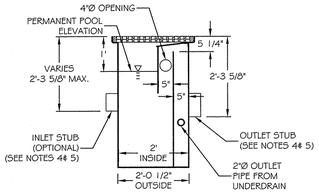
3-CARTRIDGE CATCHBASIN - SECTION VIEW (A / 1)

THE STORMWATER MANAGEMENT StormFilter® U.S. PATENT No. 5,322,629, No. 5,707,527, No. 6,027,639 No. 6,649,045, No. 5,624,576, AND OTHER U.S. AND FOREIGN PATENTS PENDING

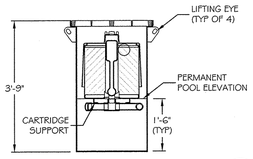
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STEEL CATCHBASIN STORMFILTER PLAN AND SECTION VIEWS STANDARD DETAIL - 3 CARTRIDGE UNIT	DRAWING 1 / 3
DATE: 11/01/05 | SCALE: NONE | FILE NAME: CBSF3-S-DTL | DRAWN: MJW | CHECKED: ARG	



3-CARTRIDGE CATCHBASIN - SECTION VIEW (B / 2)



3-CARTRIDGE CATCHBASIN - SECTION VIEW (C / 2)

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STEEL CATCHBASIN STORMFILTER SECTION VIEWS STANDARD DETAIL - 3 CARTRIDGE UNIT	DRAWING 2 / 3
DATE: 11/01/05 | SCALE: NONE | FILE NAME: CBSF3-S-DTL | DRAWN: MJW | CHECKED: ARG	

GENERAL NOTES

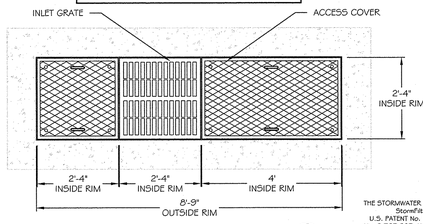
1) STORMFILTER BY CONTECH STORMWATER SOLUTIONS; PORTLAND, OR (800) 548-4667; SCARBOROUGH, ME (877) 907-8676; ELKRIDGE, MD (866) 740-3310.
2) FILTERS TO BE SIPHON-ACTUATED AND SELF-CLEANING.
3) STEEL STRUCTURE TO BE MANUFACTURED OF 1/4 INCH STEEL PLATE.
4) STORMFILTER REQUIRES 2.3 FEET OF DROP FROM RIM TO OUTLET. INLET SHOULD NOT BE LOWER THAN OUTLET. INLET (IF APPLICABLE) AND OUTLET PIPING TO BE SPECIFIED BY ENGINEER AND PROVIDED BY CONTRACTOR.
5) CBSF EQUIPPED WITH 4 INCH (APPROXIMATE) LONG STUBS FOR INLET (IF APPLICABLE) AND OUTLET PIPING. STANDARD OUTLET STUB IS 8 INCHES IN DIAMETER. MAXIMUM OUTLET STUB IS 15 INCHES IN DIAMETER. CONNECTION TO COLLECTION PIPING CAN BE MADE USING FLEXIBLE COUPLING BY CONTRACTOR.
6) FOR H-20 LOAD RATING, CONCRETE COLLAR IS REQUIRED. CONCRETE COLLAR WITH QUANTITY (2) #4 REINFORCING BARS TO BE PROVIDED BY CONTRACTOR.
7) ALL STORMFILTERS REQUIRE REGULAR MAINTENANCE. REFER TO OPERATION AND MAINTENANCE GUIDELINES FOR MORE INFORMATION.

3-CARTRIDGE CATCHBASIN STORMFILTER DATA

STRUCTURE ID		--
WATER QUALITY FLOW RATE (cfs)		0.037
PEAK FLOW RATE (<1 cfs)		0.189
RETURN PERIOD OF PEAK FLOW (yrs)		100
CARTRIDGE FLOW RATE (15 OR 7.5 gpm)		7.5
MEDIA TYPE (CSF, PERLITE, ZPG)		ZPG
RIM ELEVATION		9.90
PIPE DATA:	I.E.	DIAMETER
INLET STUB	--	--
OUTLET STUB	7.6	12"

CONFIGURATION

SLOPED LID	NO
SOLID COVER	NO
NOTES/SPECIAL REQUIREMENTS:	



3-CARTRIDGE CATCHBASIN - TOP VIEW (1 / 3)

THE STORMWATER MANAGEMENT StormFilter® U.S. PATENT No. 5,322,629, No. 5,707,527, No. 6,027,639 No. 6,649,045, No. 5,624,576, AND OTHER U.S. AND FOREIGN PATENTS PENDING

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STEEL CATCHBASIN STORMFILTER TOP VIEW, NOTES AND DATA STANDARD DETAIL - 3 CARTRIDGE UNIT	DRAWING 3 / 3
DATE: 11/01/05 | SCALE: NONE | FILE NAME: CBSF3-S-DTL | DRAWN: MJW | CHECKED: ARG	

4 CATCHBASIN STORMFILTER STEEL 3 - CARTRIDGES

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LKG/DN	DSG
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TDS	10751-002-01
DRAWING NAME	
NOTES AND DETAILS	

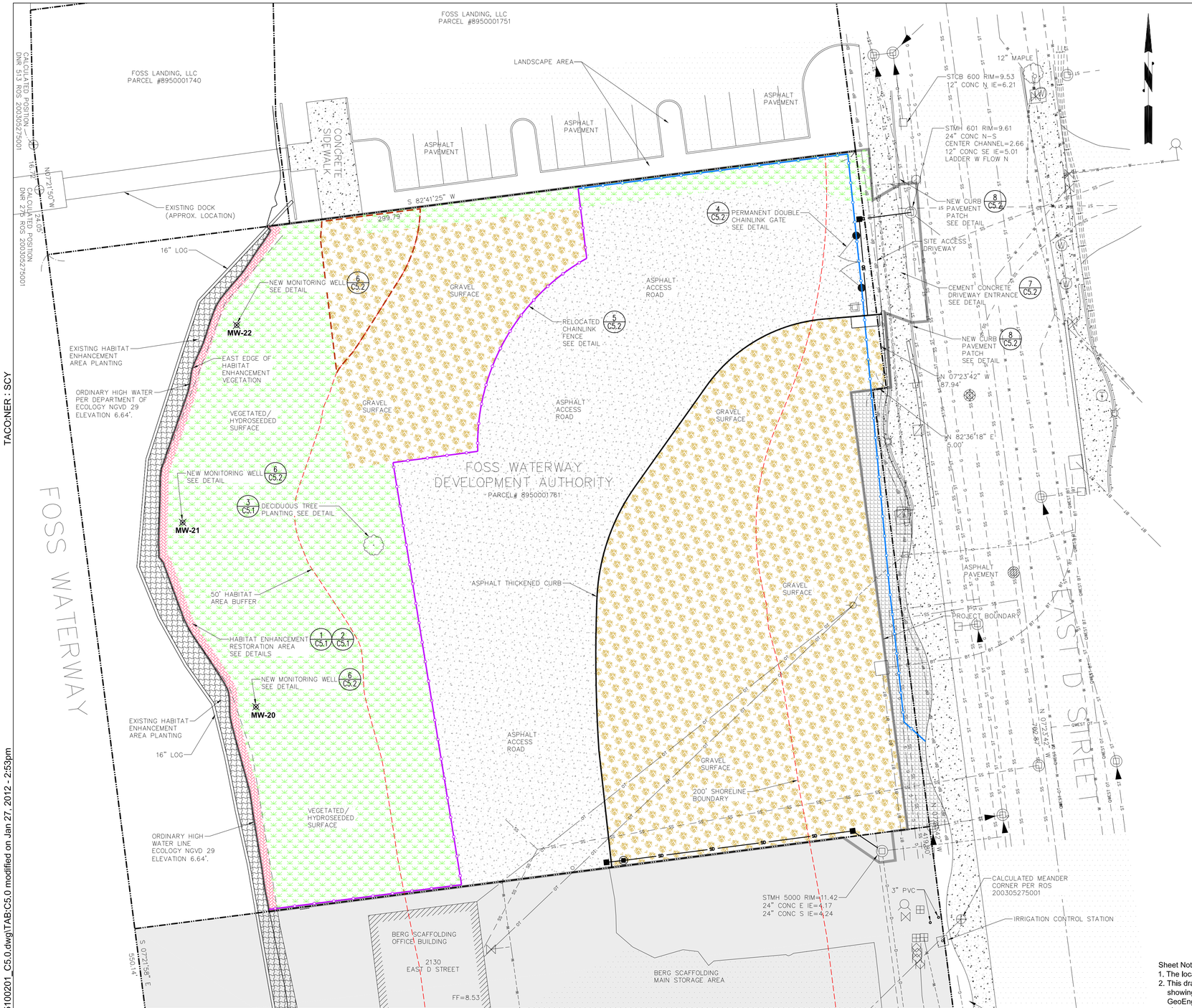
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CONSTRUCTION DIVISION

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

American Plating Site Remediation Project
Tacoma, Washington
Utility Corridor Areas (UCA) Details

SHEET NO. C4.6
SHEET 13 OF 16



LEGEND

- MW-20 ⊠ NEW GROUNDWATER MONITORING WELL TO BE INSTALLED IN ACCORDANCE WITH THE PROJECT COMPLIANCE MONITORING PLAN
- SIGN AS NOTED
- STORM CLEANOUT
- STORM CATCH BASIN
- FSTORM MANHOLE
- GAS VALVE
- GUY ANCHOR
- UTILITY POWER POLE
- JUNCTION BOX
- LUMINAIRE
- COMMUNICATIONS MANHOLE
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- ADJUSTED MANHOLE
- ABANDONED MANHOLE
- FENCE GATE
- WATER METER
- WATER MANHOLE
- WATER VALVE
- DECIDUOUS TREE
- NEW GATE POST
- QWEST OT — QWEST OVERHEAD COMMUNICATION
- QWEST BT — QWEST BURIED CABLE LINE
- ST — STORM SEWER LINE
- BP — BURIED POWER LINE
- BT — BURIED CABLE LINE
- SS — SANITARY SEWER LINE
- G — GAS LINE
- W — WATER LINE
- T — COMMUNICATION LINE
- P — POWER LINE
- D — STORM LINE
- OP — OVERHEAD POWER
- OT — OVERHEAD COMMUNICATION
- X — FENCE
- RELOCATED CHAINLINK FENCE
- CURRENT CHAINLINK FENCE LOCATION
- GRAVEL AREA WITHIN HABITAT BUFFER AREA
- PARCEL BOUNDARY
- PARCEL 8950001791 NOT FOR CONSTRUCTION
- PROJECT BOUNDARY
- CONTRACTOR SHALL NOT OPERATE IN THIS AREA
- HABITAT ENHANCEMENT RESTORATION AREA
- 15" SOIL / 3" ASPHALT CAP
- 3' CAP WITH GRAVEL SURFACE
- 3' CAP WITH VEGETATED SURFACE

GENERAL RESTORATION NOTES

1. THE CONTRACTOR SHALL PERFORM SITE RESTORATION WORK FOLLOWING THE COMPLETION OF SITE CAPPING.
2. SITE RESTORATION SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND DETAILS ON SHEETS C5.1 AND C5.2.
3. THE CONTRACTOR SHALL MAINTAIN ALL TEMPORARY EROSION AND SEDIMENT CONTROL FACILITIES INCLUDING THE WATER MANAGEMENT SYSTEM, UNTIL THE SITE HAS BEEN FULLY STABILIZED AND SITE RESTORATION HAS BEEN ACCEPTED BY THE ENGINEER AND OWNER.
4. ANY DAMAGES TO STRUCTURES OR PROPERTY INCLUDING, BUT NOT LIMITED TO, DRIVEWAYS, SIDEWALKS, PAVEMENT, BUILDINGS, LANDSCAPING, VEHICLES, WATER QUALITY, SURROUNDING PRIVATE PROPERTY, THE FOSS WATERWAY OR CITY RIGHTS-OF-WAYS CAUSED BY THE CONTRACTOR DURING PROJECT WORK, WILL BE RESTORED AT THE CONTRACTOR'S SOLE EXPENSE.

HABITAT ENHANCEMENT RESTORATION AREA NOTES

1. THE PORTION OF THE EXISTING HABITAT ENHANCEMENT RESTORATION AREA THAT IS PRESENT AT OR ABOVE THE OHW LINE AND THAT IS REMOVED TO COMPLETE SITE CAPPING WILL BE REPLACED AS SHOWN ON SHEET C5.0.
2. THE CONTRACTOR SHALL PERFORM PLANTING IN THE HABITAT ENHANCEMENT RESTORATION AREA IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND DETAILS ON SHEET C5.1.
3. EXTREME CARE SHALL BE TAKEN DURING RESTORATION WORK AT AND ADJACENT TO THE WESTERN PROJECT BOUNDARY. SITE WORK SHALL NOT AFFECT THE AREA BEYOND THE WESTERN SITE BOUNDARY BELOW OHW AND SURFACE WATER IN THE THEA FOSS WATERWAY. ANY EFFECTS, IMPACTS, AND DAMAGES TO THE AREA BEYOND THE WESTERN SITE BOUNDARY BELOW OHW AND/OR SURFACE WATER IN THE THEA FOSS WATERWAY RESULTING FROM THE CONTRACTOR'S OPERATIONS OR WORK AND ANY ASSOCIATED PENALTIES, FINES, OR OTHER MONETARY COSTS RESULTING FROM THE EFFECTS, IMPACTS, AND DAMAGES SHALL BE BORNE BY THE CONTRACTOR.
4. THE CONTRACTOR SHALL BE AWARE THAT THE RESTORATION LANDSCAPING COMPONENTS WILL REQUIRE PLANTING MAINTENANCE AND A PLANTING WARRANTY PERIOD.

HYDROSEEDING NOTES

1. HYDROSEEDING SHALL BE PERFORMED IN THE AREA IDENTIFIED ON SHEET C5.0.
2. HYDROSEEDING SHALL OCCUR AFTER APRIL 1, 2012 AND SHALL BE COMPLETED PRIOR TO MAY 31, 2012 UNLESS OTHERWISE ALLOWED BY ENGINEER.
3. HYDROSEED TO BE USED SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION 8-01.3(2) AND 9-14.2.
4. HYDROSEED SHALL BE COMPRISED OF THE FOLLOWING MIXTURE AND SHALL BE APPLIED AT THE FOLLOWING RATE PER 1,000 SQUARE FEET:
   - 50# WOOD FIBER
   - 10# BRIER GROUP'S RAPID GRO ER (OR APPROVED EQUAL)
   - 10# 25-5-15 FERTILIZER
   - 1.5# TACKIFIER
5. FOR SEED BEDS PLANTED BETWEEN OCTOBER 31 AND APRIL 30, INCREASE APPLICATION RATE TO PROVIDED A MINIMUM 1/4" THICKNESS OF BFM (BONDED FIBER MATRIX).
6. SEED BEDS PLANTED BETWEEN MAY 1 AND OCTOBER 31 WILL REQUIRE IRRIGATION AND OTHER MAINTENANCE AS NECESSARY TO FOSTER AND PROTECT THE ROOT STRUCTURE.
7. BEFORE SEEDING, INSTALL NEEDED SURFACE RUNOFF CONTROL MEASURES.
8. THE SEED BED SHALL BE FIRM WITH A FAIRLY FINE SURFACE, FOLLOWING SURFACE ROUGHENING, PERFORM ALL OPERATIONS ACROSS OR AT RIGHT ANGLES TO THE SLOPE.

GROUNDWATER MONITORING WELL INSTALLATION NOTES

1. THE CONTRACTOR SHALL INSTALL NEW, REPLACEMENT MONITORING WELLS AT THE LOCATIONS SHOWN ON SHEET C5.0 IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND DETAIL ON SHEET C5.2.
2. DRILLING AND CONSTRUCTION OF THE MONITORING WELLS WILL BE PERFORMED BY A WASHINGTON STATE LICENSED DRILLER IN ACCORDANCE WITH THE MINIMUM STANDARDS FOR CONSTRUCTION AND MAINTENANCE OF WELLS (CHAPTER 173-160 WAC). THE ENGINEER WILL PROVIDE A LICENSED GEOLOGIST TO OBSERVE AND LOG THE BORINGS AS WELL AS OVERSEE WELL INSTALLATION.

DECIDUOUS TREE PLANTING NOTES

1. THE CONTRACTOR PLANT A NEW DECIDUOUS TREE IN THE LOCATION SHOWN ON SHEET C5.0.
2. THE CONTRACTOR SHALL PLANT THE NEW DECIDUOUS TREE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND DETAIL SHOWN ON SHEET C5.1.
3. THE DEPTH OF TREE INSTALLATION SHALL BE LIMITED TO THE DEPTH OF SITE CAPPING MATERIALS. SITE SOIL BENEATH THE CAP SHALL NOT BE DISTURBED OR REMOVED DURING TREE INSTALLATION ACTIVITIES.

FENCING RESTORATION NOTES

1. THE CONTRACTOR SHALL RESTORE SITE FENCING USING EXISTING CHAINLINK FENCING AND ASSOCIATED GATE MATERIALS AND HARDWARE THAT WERE REMOVED AND SALVAGED DURING SITE PREPARATION ACTIVITIES.
2. THE CONTRACTOR SHALL REINSTALL SITE FENCING IN THE LOCATIONS SHOWN ON SHEET C5.0 IN ACCORDANCE WITH THE DETAILS SHOWN ON SHEET C5.2.
3. NEW FENCE POSTS AND ASSOCIATED HARDWARE WILL BE USED TO REINSTALL SITE FENCING AS WELL AS NEW CHAINLINK FENCING AND GATE MATERIALS IF EXISTING CHAINLINK FENCING AND GATE MATERIALS HAVE BEEN EXHAUSTED DURING RE-INSTALLATION OR IF PORTIONS OF THE CHAIN LINK FENCING AND GATE MATERIALS ARE DEFICIENT AND NOT ABLE TO BE USED.

CITY RIGHTS-OF-WAY AND UTILITIES RESTORATION NOTES

1. THE CONTRACTOR SHALL REINSTALL/RESTORE TO THE ORIGINAL CONDITION, ANY UTILITIES THAT WERE DISCONNECTED, RELOCATED, AND/OR DAMAGED DURING SITE WORK, EXCLUDING THE PORTION OF THE WATER LINE LOCATED ON THE SITE ADJACENT TO THE SOUTHERN PROJECT BOUNDARY. IF ENCOUNTERED, THE ABANDONED WATER LINE SHALL BE CUT BACK TO THE SOUTHERN PROJECT BOUNDARY, CAPPED OR PLUGGED APPROPRIATELY AND SURVEYED WHERE CUT AND ABANDONED PRIOR TO SITE CAPPING ACTIVITIES.
2. THE CONTRACTOR SHALL RESTORE ALL UTILITIES, STRUCTURES AND SURFACES WITHIN THE CITY OF TACOMA ROW THAT WERE DISCONNECTED, RELOCATED, REMOVED, AND/OR DAMAGED DURING SITE WORK IN ACCORDANCE WITH THE CITY ROW RESTORATION POLICY (ADOPTED JUNE 2, 2009) AND THE CITY MUNICIPAL CODE, VOLUMES I AND II.

20 0 20 40
Scale in Feet

Sheet Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base CAD drawing provided by AHBL, dated 08-26-2011.

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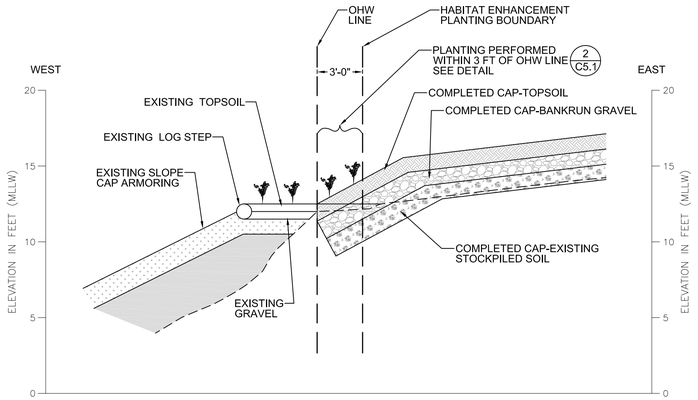
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CONSTRUCTION DIVISION

American Plating Site Remediation Project
Tacoma, Washington
Site Restoration Plan

SHEET NO. C5.0
SHEET 14 OF 16

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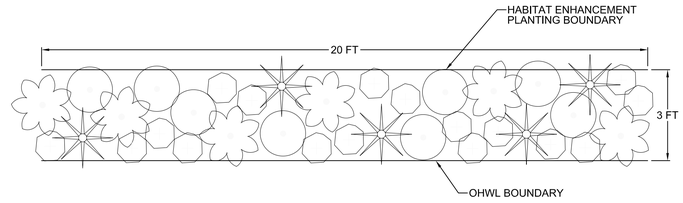


NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF THE PLANTING PLAN, PROTECTION OF THE HABITAT ENHANCEMENT RESTORATION AREA, MAINTAINING APPROPRIATE PROTECTIVE BARRIERS, AND FIELD STAKING THE PLANTING AREA BOUNDARIES. THE CONTRACTOR SHALL BE QUALIFIED AS KNOWLEDGEABLE ABOUT LANDSCAPE AND PLANT INSTALLATION. THE ENGINEER SHALL OVERSEE THE WORK AND UTILIZE A QUALIFIED BIOLOGIST/ MITIGATION SPECIALIST TO OVERSEE RESTORATION ACTIVITIES, AS NEEDED.
2. ALL NATIVE PLANTS SHALL BE OBTAINED FROM LOCAL NATIVE PLANT NURSERIES, PLANTS SHOULD BE FROM GENETIC STOCK ORIGINATING FROM THE PUGET SOUND AREA IF POSSIBLE. NUMBERS, TYPES, CONDITION, SPACING, AND SPECIFICATIONS OF PLANTS TO BE USED SHALL FOLLOW THOSE IDENTIFIED IN THE PLANTING PLAN, TYPICAL DETAILS, AND PLANT SCHEDULE. SUBSTITUTIONS MAY BE MADE ONLY WITH WRITTEN AUTHORIZATION FROM THE ENGINEER FOLLOWING CONSULTATION WITH THE CONSULTING BIOLOGIST/MITIGATION SPECIALIST. NATIVE PLANTS SHALL BE INSTALLED AS SPECIFIED IN THE PLANTING PLAN, PLANTING DETAILS, AND PLANTING SCHEDULE TO PROMOTE DEVELOPMENT OF THE NATIVE PLANT COMMUNITIES SHOWN IN THE PLANTING PLAN.
3. THE PLANTS SHALL BE PLACED ON THE SURFACE OF THE HABITAT ENHANCEMENT RESTORATION AREA IN THE LAYOUT SHOWN ON SHEET C5.1 AND BE INSPECTED AND APPROVED BY ENGINEER BEFORE THE PLANTS ARE INSTALLED.
4. NO PLANTING IS TO BE DONE IN TEMPERATURES BELOW 40°F AND ABOVE 85°F. ALL PLANTING ACTIVITIES AT THE SITE SHALL BE COMPLETED PRIOR TO MAY 31, 2012 UNLESS OTHERWISE ALLOWED BY THE OWNER.
5. ALL INSTALLED PLANTS SHALL BE TIED WITH COLOR-CODED FLAGGING TAPE TO ASSIST IN IDENTIFICATION OF INSTALLED PLANTS DURING MONITORING EVENTS.
6. GOOSE EXCLOSURES SHALL BE FORMED BY INSTALLING A SERIES OF REBAR STAKES ALONG THE UPPER AND LOWER EDGE OF THE HABITAT ENHANCEMENT PLANTING BOUNDARIES ON APPROXIMATE 20-FT CENTERS. REBAR SHALL BE FIRMLY DRIVEN INTO THE SUBSTRATE WITH APPROXIMATELY 2 FEET EXPOSED. A DURABLE SYNTHETIC TWINE SHALL BE STRUNG AMONG THE REBAR AT AN APPROXIMATE ELEVATION OF 15 TO 20 INCHES ABOVE THE SUBSTRATE TO FORM A COVER OVER THE PLANTINGS. SPACING OF TWINE STRANDS SHALL NOT EXCEED 3 FEET. TWO LINES OF TWINE SHALL ALSO BE RUN BETWEEN THE REBAR AROUND THE PERIMETER OF THE PLANTED AREA AT ELEVATIONS OF APPROXIMATELY 6 AND 12 INCHES ABOVE THE SURFACE. ALTERNATIVELY, CHICKEN WIRE MAY BE PLACED AROUND THE PERIMETER OF THE PLANTED AREA TO A HEIGHT OF 12 IN. ABOVE THE SURFACE.
7. EXCLOSURE SHALL BE INSPECTED AND ANY DAMAGE TO THE EXCLOSURE REPAIRED. IF EVIDENCE OF HERBIVORY IS OBSERVED, THE HERBIVORE SHALL BE IDENTIFIED AS AVIAN (GEESE) OR TERRESTRIAL (RABBITS). IF AVIAN HERBIVORY IS EVIDENT, ADDITIONAL TWINE SHALL BE STRUNG TO LIMIT POSSIBLE POINTS OF ENTRY. IF RABBIT DAMAGE IS SIGNIFICANT, TO THE POINT OF COMPROMISING THE SUCCESS OF THE PLANTINGS, HARDWARE CLOTH OR CHICKEN WIRE SHALL BE INSTALLED AROUND THE PERIMETER OF THE PLANTED AREA.
8. TO PROMOTE ESTABLISHMENT, GROWTH, AND SURVIVAL OF PLANTINGS, A MINIMUM MAINTENANCE PERIOD WILL BE REQUIRED FOR AT LEAST ONE YEAR OR UNTIL PLANTINGS ARE SUCCESSFULLY ESTABLISHED AS DETERMINED BY THE ENGINEER'S BIOLOGIST/MITIGATION SPECIALIST.
9. CONTRACTOR SHALL PROVIDE A ONE-YEAR WARRANTY FOR ALL PLANTS PROVIDED.

1/C5.0 DETAIL - HABITAT ENHANCEMENT PLANTING AREA SECTION

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Scale in Feet

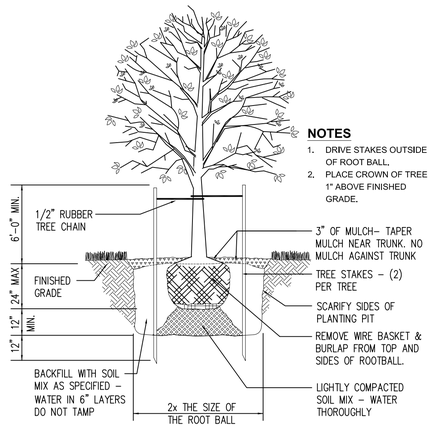


Plant Schedule for Habitat Restoration Area

Plant Symbol	Common Name	Scientific Name	Condition[1]	Spacing on Center	Quantity	Notes
	Shrubs					
	Coastal Strawberry	*Fragaria chiloensis*	Bare root or plug	1 ft.	17 per 60 sf	Plant in groups of 2-3, 1' on center spacing
	Low Oregon Grape	*Mahonia nervosa*	Bare root / container (2 years,18-inch minimum / 1 gallon)	18 inches	8 per 60 sf	Plant in irregular pattern using typical planting plan as a guide
	Nootka Rose	*Rosa Nutkana*	Bare root / container (2 years,18-inch minimum / 1 gallon)	2 ft.	6 per 60 sf	Plant in irregular pattern using typical planting plan as a guide
	Grasses					
	Tufted hairgrass	*Deschampsia cespitosa*	Bare root or plug (minimum 4-inch aboveground stem)	2 ft.	5 per 60 sf	Plant in irregular pattern using typical planting plan as a guide
	Total Plants				**487**	

[1] - Conditions for height and spread are for container grown materials as specified by American Nursery Standards, ANSI Z60.1-1996. If barefoot materials are used, conditions shall follow appropriate American Nursery Standards.

2/C5.0 DETAIL - TYPICAL HABITAT RESTORATION PLANTING PLAN
(NOT TO SCALE)



NOTES

1. DRIVE STAKES OUTSIDE OF ROOT BALL.
2. PLACE CROWN OF TREE 1" ABOVE FINISHED GRADE.

Plant Schedule for Deciduous Tree

Code	Scientific Name	Common Name	Container	Caliper	Quantity	Remarks
FL	*Fraxinus latifolia*	Oregon ash	Ball & burlap	2-inch Caliper	1	See sheet C5.0 for tree location.

3/C5.0 DETAIL - DECIDUOUS TREE PLANTING
(NOT TO SCALE)

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DRAWING NAME 1075100201_C5.1

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STATE OF WASHINGTON
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PROFESSIONAL ENGINEER

CONSTRUCTION DIVISION

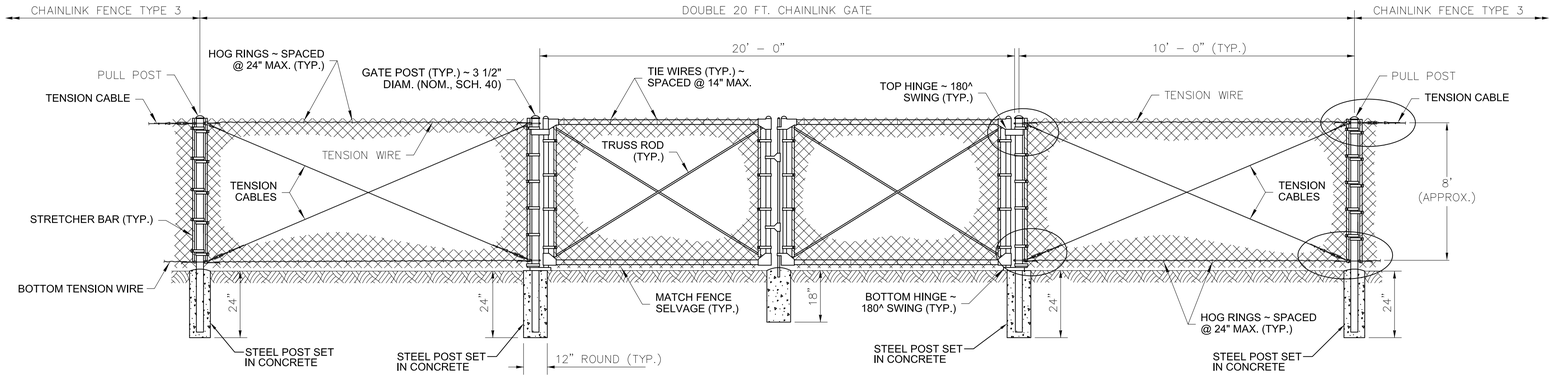
CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

American Plating Site Remediation Project
Tacoma, Washington
Site Restoration Plan Details

SHEET NO. C5.1
SHEET 15 OF 16

TACO:NER : SCY

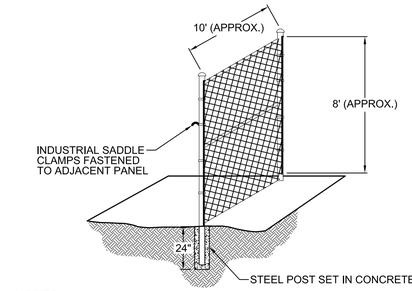
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NOTES

1. REFER TO WSDOT STANDARD SPECIFICATION 8-12.3(1)E FOR CONSTRUCTION DETAILS.
2. NO PAINTING OR PROTECTIVE COATING WILL BE REQUIRED FOR FENCING INSTALLATION.

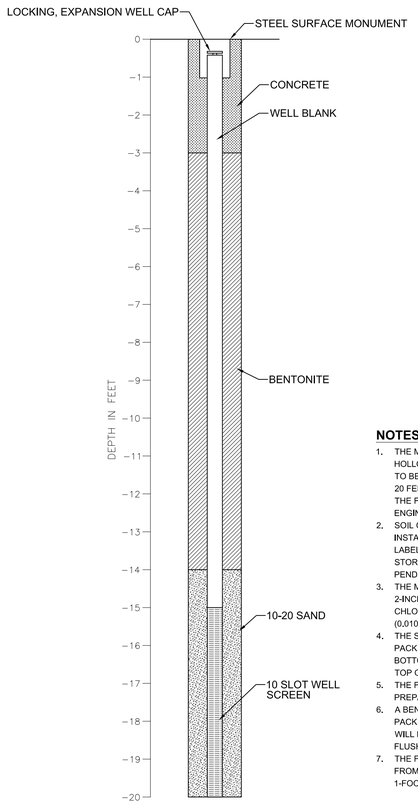
4 C5.0 DETAIL - PERMANENT DOUBLE CHAINLINK GATE
(NOT TO SCALE)



NOTES

1. REFER TO WSDOT STANDARD SPECIFICATION 8-12.1 THROUGH 8-12.3(D) FOR CONSTRUCTION DETAILS.
2. NO PAINTING OR PROTECTIVE COATING WILL BE REQUIRED FOR FENCING INSTALLATION.

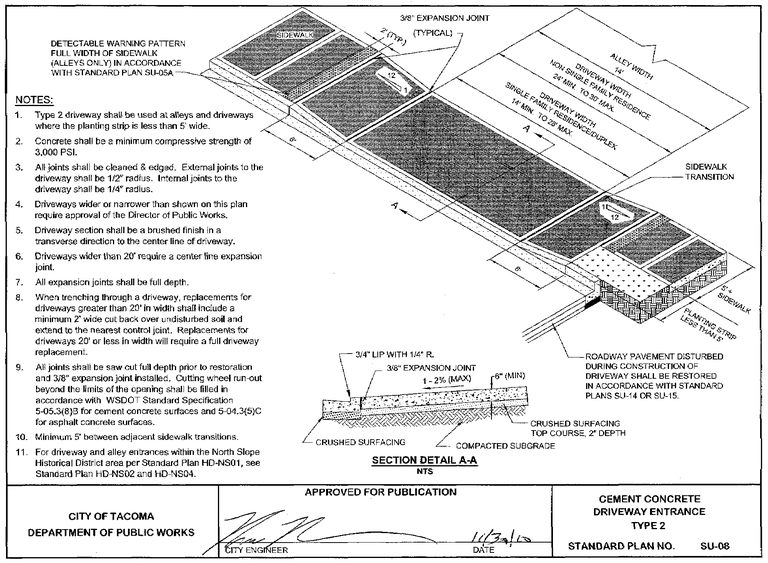
5 C5.0 DETAIL - RELOCATED CHAINLINK FENCE
(NOT TO SCALE)



NOTES

1. THE MONITORING WELL BORINGS SHALL BE DRILLED USING A HOLLOW-STEM AUGER DRILL RIG. THE MONITORING WELLS ARE TO BE INSTALLED TO DEPTHS BETWEEN APPROXIMATELY 15 AND 20 FEET BGS. WELL SCREEN INTERVAL WILL BE DETERMINED IN THE FIELD BY A REGISTERED GEOLOGIST PROVIDED BY THE ENGINEER.
2. SOIL CUTTINGS FROM THE BORINGS COMPLETED FOR INSTALLATION OF THE MONITORING WELLS WILL BE PLACED IN LABELED AND SEALED 55 GALLON DRUMS. THE DRUMS WILL BE STORED TEMPORARILY AT A SECURE LOCATION ON THE SITE PENDING OFFSITE DISPOSAL AT A PERMITTED DISPOSAL FACILITY.
3. THE MONITORING WELLS WILL BE CONSTRUCTED OF 2-INCH-DIAMETER, FLUSH-THREADED, SCHEDULE 40 POLYVINYL CHLORIDE (PVC) CASING WITH MACHINE-SLOTTED PVC SCREEN (0.010-INCH).
4. THE SCREENED INTERVAL WILL BE 5-FEET IN LENGTH. A FILTER PACK WILL BE INSTALLED AROUND THE WELL SCREEN FROM THE BOTTOM OF THE WELL TO APPROXIMATELY 1-FOOT ABOVE THE TOP OF THE WELL SCREEN.
5. THE FILTER PACK MATERIAL WILL CONSIST OF COMMERCIALLY PREPARED 10-20 SILICA SAND.
6. A BENTONITE ANNULAR SEAL WILL BE PLACED ABOVE THE SAND PACK TO A DEPTH OF APPROXIMATELY 1-FOOT BGS. EACH WELL WILL BE COMPLETED WITH A CONCRETE SURFACE SEAL AND A FLUSH-MOUNT MONUMENT.
7. THE FLUSH-MOUNT MONUMENT WILL BE CEMENTED IN PLACE FROM THE SURFACE TO A DEPTH OF BETWEEN APPROXIMATELY 1-FOOT BGS.

6 C5.0 DETAIL - TYPICAL NEW MONITORING WELL SECTION
HORIZONTAL SCALE: NO SCALE
VERTICAL SCALE: 1" = 2'



NOTES:

1. Type 2 driveway shall be used at alleys and driveways where the planting strip is less than 5' wide.
2. Concrete shall be a minimum compressive strength of 3,000 PSI.
3. All joints shall be cleaned & edged. External joints to the driveway shall be 1/2" radius. Internal joints to the driveway shall be 1/4" radius.
4. Driveways wider or narrower than shown on this plan require approval of the Director of Public Works.
5. Driveway section shall be a brushed finish in a transverse direction to the center line of driveway.
6. Driveways wider than 20' require a center line expansion joint.
7. All expansion joints shall be full depth.
8. When trenching through a driveway, replacements for driveways greater than 20' in width shall include a minimum 2' wide cut back over undisturbed soil and extend to the nearest control joint. Replacements for driveways 20' or less in width will require a full driveway replacement.
9. All joints shall be saw cut full depth prior to restoration and 3/8" expansion joint installed. Cutting wheel run-out beyond the limits of the opening shall be filled in accordance with WSDOT Standard Specification 5-05.3(8)3 for cement concrete surfaces and 5-04.3(5)C for asphalt concrete surfaces.
10. Minimum 5' between adjacent sidewalk transitions.
11. For driveway and alley entrances within the North Slope Historical District area per Standard Plan HD-NS01, see Standard Plan HD-NS02 and HD-NS04.

SECTION DETAIL A-A
NTS

CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS	APPROVED FOR PUBLICATION CITY ENGINEER ____ DATE 11/23/12	CEMENT CONCRETE DRIVEWAY ENTRANCE TYPE 2 STANDARD PLAN NO. SU-08

7 C5.0 DETAIL - CEMENT CONCRETE DRIVEWAY ENTRANCE - TYPE 2
(NOT TO SCALE)

8 C5.0 DETAIL - NEW CURB PAVEMENT PATCH
(NOT TO SCALE)

CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555

Sheet Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

GeoEngineers
1101 S. Fawcett Avenue, Suite 200
Tacoma, WA 98402
Telephone (253) 383-4940
Fax (253) 383-4923

Structural Engineers
Landscape Architects
Community Planners
Land Surveyors
Neighbors

AHBL
TACOMA · SEATTLE
2215 North 30th Street, Suite 300, Tacoma, WA 98403
253.383.2422 TEL
1200 Sixth Avenue, Suite 1620, Seattle, WA 98101

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED BY DATE FIELD BOOKS

DATE	SCALE
01/26/2012	AS NOTED
DESIGNED	CHECKED
NER/IHW	CLB
DRAWN	PROJECT NAME
SCY	10751-002-01
DRAWING NAME	
1075100201_C5.2	

1/26/12 CHRISTOPHER LEWIS DALEY STATE OF WASHINGTON 39963 REGISTERED PROFESSIONAL ENGINEER

CONSTRUCTION DIVISION

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

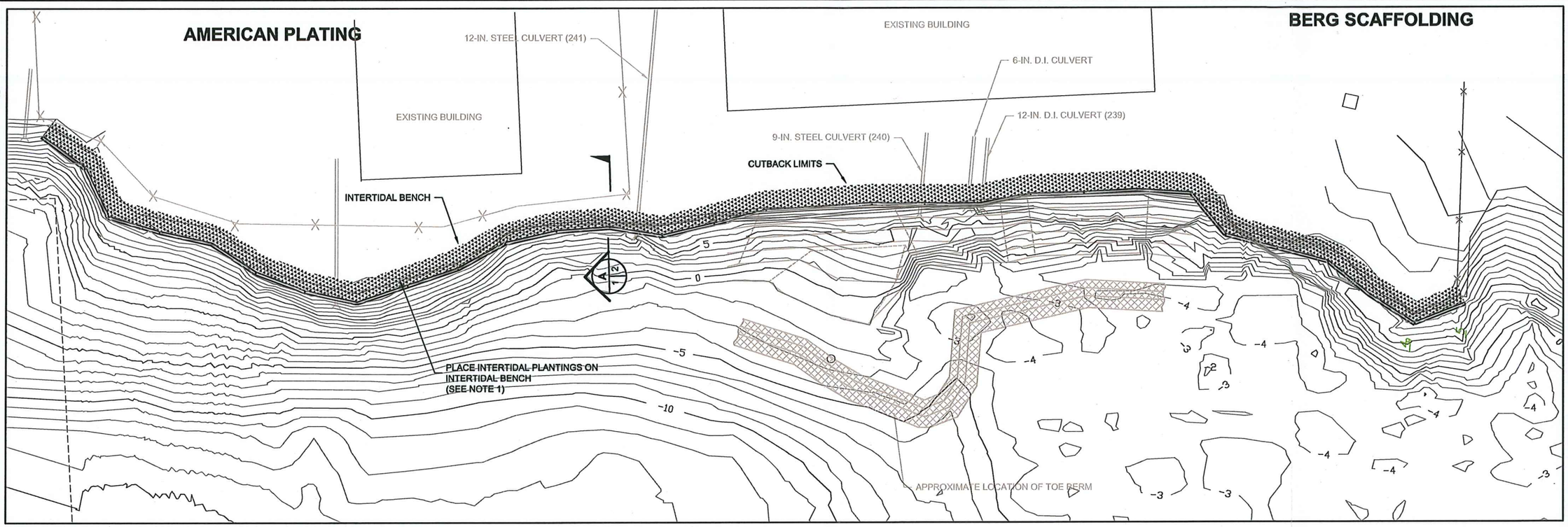
American Plating Site Remediation Project
Tacoma, Washington
Site Restoration Plan Details

SHEET NO. C5.2
SHEET 16 OF 16

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TACO:NER : SCY

ATTACHMENT 1
Shoreline Habitat Enhancement Plans



SOURCE: BASE MAP PREPARED FROM ELECTRONIC DRAWING PAP00103-03A.DWG PROVIDED BY DALTON, OLMSTED & FUGLEVAND, INC., TITLED "DOF POST-DREDGE BATHYMETRIC CONTOURS WITH INCA UPLAND," DATED 10/27/03.

N

PLANTING PLAN - BERG SCAFFOLDING SITE

0 20 40

SCALE IN FEET

LEGEND

- INTERTIDAL PLANTING AREA
- LOG STEP
- EXISTING FENCE
- SECTION IDENTIFICATION
- SHEET WHERE SECTION IS SHOWN
- SHEET WHERE SECTION IS REFERENCED
- DETAIL NUMBER
- SHEET WHERE DETAIL IS SHOWN
- SHEET WHERE DETAIL IS REFERENCED

NOTE:
1. INTERTIDAL PLANTINGS WILL BE INSTALLED ABOVE LOG STEP IN A SWATH 5 TO 8 FT WIDE. SEE SHEETS 2 AND 3.

HARTCROWSER

Mark	Description	Date	Appr.

Designed by: MJM | Date: 3/22/04 | Rev. 0
Dwn by: CAS | Ckd by: GTB | Job Number: 7853-01
Reviewed by: JPH | : | :
Submitted by: HART CROWSER, INC. | File name: 78530100 | Plot date: | Plot scale: SEE DRAWING

HARTCROWSER

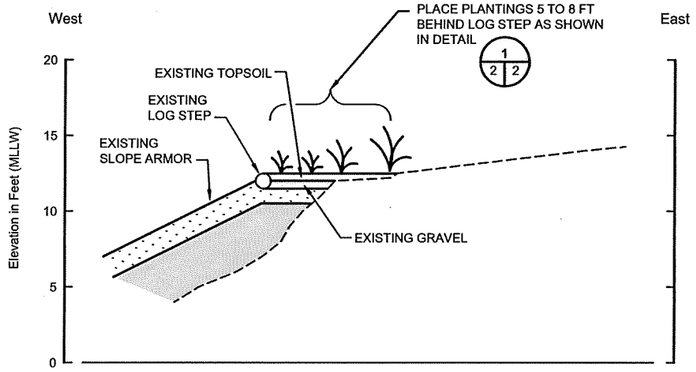
BERG SCAFFOLDING AREA

BERG SCAFFOLDING

INTERTIDAL PLANTING PLAN

Sheet reference number: 1

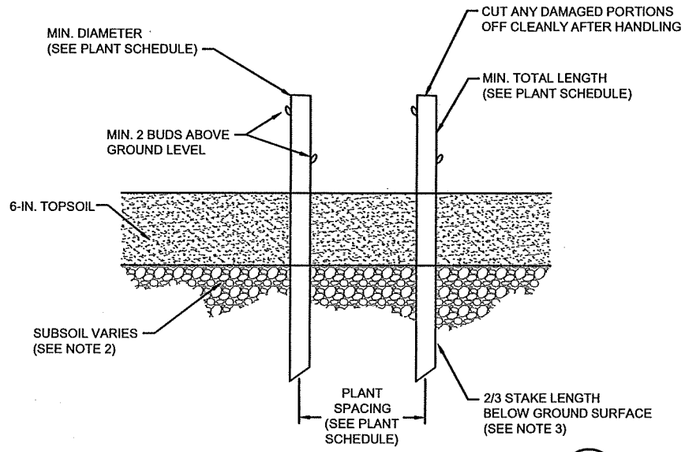
Sheet 1 of 3



SECTION - INTERTIDAL BENCH PLANTING A (1 2)

0 5 10

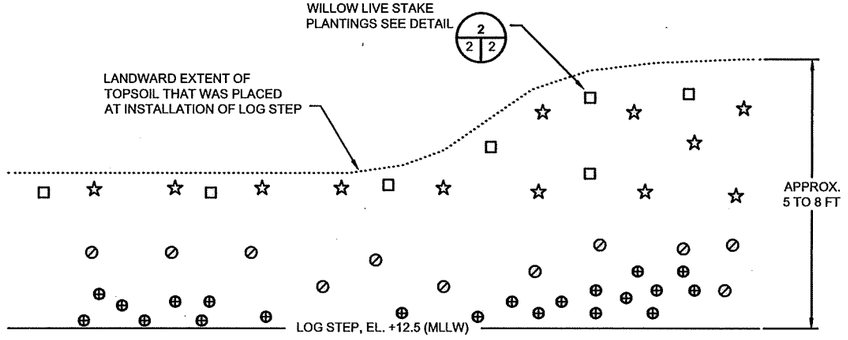
SCALE IN FEET



DETAIL - TYPICAL WILLOW LIVE STAKE PLANTING 2 (2 2)

NOT TO SCALE

NOTES:
1. USE REBAR OR PIPE TO MAKE A PILOT HOLE. DRIVE STAKES TO BOTTOM OF PILOT HOLE WITH A RUBBER MALLET.
2. SUBSOIL MAY CONSIST OF NATIVE MATERIAL OR APPROXIMATELY 6 IN. OF GRAVEL OVER QUARRY SPALLS.
3. WHERE QUARRY SPALLS OR DEBRIS LIMIT STAKE PENETRATION, THE STAKE SHALL BE CUT TO MAINTAIN SPECIFIED LENGTH PROPORTION.



DETAIL - TYPICAL BERG SCAFFOLDING PLANTING PLAN 1 (2 2)

NOT TO SCALE

⊘ SALTGRASS

⊕ FLESHY JAUMEA

☆ TUFTED HAIR GRASS

□ HOOKER'S WILLOW

Plant Schedule for Berg Scaffolding

Common Name	Scientific Name	Condition[1]	Spacing on Center (in Feet)	Quantity	Notes
Shrubs					
Hooker's willow	*Salix hookeriana*	BR, Live stakes (min. 0.5 in. diameter, 30 in. long) or 1 gal (well rooted and min. height 24 in.)	3 to 6	200	Plant along back of planting strip with tufted hairgrass.
Herbs					
Tufted hairgrass	*Deschampsia cespitosa*	BR, or plug (min. 4-in. above ground stem)	2	500	Plant in irregular pattern in 1 to 2 rows in back half of planting strip.
Saltgrass	*Distichlis spicata*	BR, or plug (min. 4-in. above ground stem)	2	300	Plant in groups interspersed with Fleshy jaumea in the front half of the planting strip near log step.
Fleshy jaumea	*Jaumea carnosa*	BR, or plug (min. 4-in. above ground stem)	2	300	Plant in groups interspersed with saltgrass in the front half of the planting strip near log step.
Total Plants				**1,300**	

BR – Bare root

[1] – Conditions for height and spread are for container grown materials as specified by American Nursery Standards, ANSI Z60.1-1996. If bareroot materials are used, conditions shall follow appropriate American Nursery Standards.

HARTCROWSER

Mark	Description	Date	Appr.

Designed by: MJM
Drwn by: CAS
Chkd by: GTB
Reviewed by: JPH
Submitted by: HART CROWSER, INC.
Date: 3/22/04
Job Number: 7853-01
File name: 78530101
Plot date:
Plot scale: SEE DRAWING
Rev. 0

HARTCROWSER

BERG SCAFFOLDING AREA

BERG SCAFFOLDING

INTERTIDAL PLANTING PLAN SECTION, DETAILS, AND PLANT SCHEDULE

Sheet reference number: **2**

Sheet 2 of 3

CONSTRUCTION PLAN SPECIFICATIONS

GENERAL CONSTRUCTION NOTES

1. MLLW IS SHOWN AS ELEVATION ZERO ON THE PLANTING PLAN. ANY ESTABLISHED NATIVE TREES AND SHRUBS EXISTING IN THE PLANTING AREA WILL BE SALVAGED, RETAINED, OR REPLACED AS INDICATED BY THE CITY OR CONSULTING BIOLOGIST/MITIGATION SPECIALIST.

PLANT MATERIALS

NURSERY STOCK

1. ALL NATIVE PLANTS SHALL BE OBTAINED FROM LOCAL NATIVE PLANT NURSERIES. RECOMMENDED VENDORS INCLUDE BALANCE RESTORATION NURSERY (LORANE, OR), FOURTH CORNER NURSERIES (BELLINGHAM), LAWYER NURSERY (OLYMPIA), STORM LAKE GROWERS (SNOHOMISH), JUDD CREEK NURSERY (VASHON), WOODBROOK NURSERY (GIG HARBOR), AND SOUND NATIVE PLANTS (OLYMPIA). PLANTS SHOULD BE FROM GENETIC STOCK ORIGINATING FROM THE PUGET SOUND AREA IF POSSIBLE. NUMBERS, TYPES, CONDITION, SPACING, AND SPECIFICATIONS OF PLANTS TO BE USED SHALL FOLLOW THOSE IDENTIFIED IN THE PLANTING PLAN, TYPICAL DETAILS, AND PLANT SCHEDULE. SUBSTITUTIONS MAY BE MADE ONLY WITH WRITTEN AUTHORIZATION FROM THE CITY FOLLOWING CONSULTATION WITH THE CONSULTING BIOLOGIST/MITIGATION SPECIALIST AND CONCURRENCE FROM THE TRUSTEES. NATIVE PLANTS SHALL BE INSTALLED AS SPECIFIED IN THE PLANTING PLAN, PLANTING DETAILS, AND PLANTING SCHEDULE TO PROMOTE DEVELOPMENT OF THE NATIVE PLANT COMMUNITIES SHOWN IN THE PLANTING PLAN.

GOOSE EXCLOSURES

1. GOOSE EXCLOSURES SHALL BE FORMED BY INSTALLING A SERIES OF REBAR STAKES ALONG THE UPPER AND LOWER EDGE OF THE BENCH ON APPROXIMATE 20-FT CENTERS. REBAR SHALL BE FIRMLY DRIVEN INTO THE SUBSTRATE WITH APPROXIMATELY 2 FEET EXPOSED. A DURABLE SYNTHETIC TWINE SHALL BE STRUNG AMONG THE REBAR AT AN APPROXIMATE ELEVATION OF 15 TO 20 INCHES ABOVE THE SUBSTRATE TO FORM A COVER OVER THE PLANTINGS. SPACING OF TWINE STRANDS SHALL NOT EXCEED 3 FEET. TWO LINES OF TWINE SHALL ALSO BE RUN BETWEEN THE REBAR AROUND THE PERIMETER OF THE PLANTED AREA AT ELEVATIONS OF APPROXIMATELY 6 AND 12 INCHES ABOVE THE SURFACE. ALTERNATIVELY, CHICKEN WIRE MAY BE PLACED AROUND THE PERIMETER OF THE PLANTED AREA TO A HEIGHT OF 12 IN. ABOVE THE SURFACE.
2. EXCLOSURE SHALL BE INSPECTED AND ANY DAMAGE TO THE EXCLOSURE REPAIRED. IF EVIDENCE OF HERBIVORY IS OBSERVED, THE HERBIVORE SHALL BE IDENTIFIED AS AVIAN (GEESE) OR TERRESTRIAL (RABBITS). IF AVIAN HERBIVORY IS EVIDENT, ADDITIONAL TWINE SHALL BE STRUNG TO LIMIT POSSIBLE POINTS OF ENTRY. IF RABBIT DAMAGE IS SIGNIFICANT, TO THE POINT OF COMPROMISING THE SUCCESS OF THE PLANTINGS, HARDWARE CLOTH OR CHICKEN WIRE SHALL BE INSTALLED AROUND THE PERIMETER OF THE PLANTED AREA.

MAINTENANCE

1. TO PROMOTE ESTABLISHMENT, GROWTH, AND SURVIVAL OF PLANTINGS, THE FOLLOWING MINIMUM MAINTENANCE FOR A PERIOD OF AT LEAST THREE YEARS OR UNTIL PLANTINGS ARE SUCCESSFULLY ESTABLISHED AS DETERMINED BY THE CITY OR THE CITY'S CONSULTING BIOLOGIST/MITIGATION SPECIALIST. INVASIVE WEEDS SPECIES, INCLUDING SCOT'S BROOM, HIMALAYAN BLACKBERRY, REED CANARYGRASS, AND ALL OTHERS ON THE PIERCE COUNTY NOXIOUS WEED LIST, WILL BE REMOVED (ROOTS AND SHOOTS) AT LEAST TWICE A YEAR TO REDUCE COMPETITION FOR RESOURCES. HERBICIDES APPROVED FOR USE IN AQUATIC ENVIRONMENTS BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY, SUCH AS RODEO, MAY BE USED TO CONTROL INVASIVE SPECIES. IF USED, HERBICIDES SHALL ONLY BE APPLIED BY A LICENSED APPLICATOR AND IN COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. PLANTS THAT BECOME INFECTED BY DISEASE OR INSECT PESTS SHALL BE REMOVED IMMEDIATELY AND PROPERLY DISPOSED OF. BROKEN AND DEAD LIMBS WILL BE PRUNED AND REMOVED TO STIMULATE NEW GROWTH.

HARTCROWSER

Mark	Description	Date	Appr.

Designed by: MJM | Date: 3/22/04 | Rev. 0
Dwn by: CAS | Ckd by: GTB | Job Number: 7853-01
Reviewed by: JPH | : :
Submitted by: HART CROWSER, INC. | File name: 78530109 | Plot date: | Plot scale: SEE DRAWING

HARTCROWSER

BERG SCAFFOLDING AREA

BERG SCAFFOLDING

INTERTIDAL PLANTING PLAN SPECIFICATIONS

Sheet reference number: 3

Sheet 3 of 3

ATTACHMENT 2
Figures Summarizing Contaminant Concentrations in Soil

DRAFT FINAL

11/24/03

GRL:TCM:SCY

TACO\10\10751002\00\CAD\10751100200_FIG-2_3_4_5_6.dwg

N

509 BRIDGE

AMPSMP16 (mg/kg)			
DEPTH	Pb	Cr	Cd
2–5	103	64.1	66.3

AMPSMP15 (mg/kg)			
DEPTH	Pb	Cr	Cd
2–5	80.4	72.6	24.2

AMPSMP17 (mg/kg)			
DEPTH	Pb	Cr	Cd
6	70.7	291	156

AMPSMP14 (mg/kg)			
DEPTH	Pb	Cr	Cd
2–5	317	336	15.3

AMPSS7 (mg/kg)			
DEPTH	Pb	Cr	Cd
1–3	121	154	118

AMPSS10 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–1	6.6	1,570	0.87

AMPSS6 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–1	585	3,480	205

AMPSS3 (mg/kg)			
DEPTH	Pb	Cr	Cd
3	76.5	1,360	2.45

AMPSS4 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–1	528	27.9	2.01

AMPSS8 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–1	195	2,990	230

AMPSS11 (mg/kg)			
DEPTH	Pb	Cr	Cd
2	497	15,500	415

AMPSS12 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–3	33.8	126	126

AMPSS19 (mg/kg)			
DEPTH	Pb	Cr	Cd
1–3	22.9	144	158

AMPSS18 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–3	68.2	200	185

AMPSS9 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–1	154	1,104	225

AMPSS13 (mg/kg)			
DEPTH	Pb	Cr	Cd
3	71.9	395	395

AMPSS1 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–2	*13,000*	61.5	3.5

AMPSS2 (mg/kg)			
DEPTH	Pb	Cr	Cd
5–6	9.6	20.7	1.1

AMPSS5 (mg/kg)			
DEPTH	Pb	Cr	Cd
1–2	*2,640*	88.2	2.86

FOSS LANDING

BERG SCAFFOLDING

THEA FOSS WATERWAY

EAST D STREET

SIDEWALK

SIDEWALK

"D" STREET RIGHT OF WAY

MW-1

MW-2

MW-3

MW-4

MW-5

MW-6 OR MW-1

MW-7

MW-8

MW-9

MW-10

MW-11

MW-12 (NF)

FORMER 25,000 GALLON SUMP

FORMER UST

FORMER BUILDING NO. 1

FORMER DEGREASING TANK

CONCRETE RUBBLE PILE

FORMER SUMP

FORMER BUILDING NO. 2

FORMER CONCRETE PAD

+15

+17

CRABAPPLE

CRABAPPLE

COTTONWOOD

CHERRY

PROPERTY BOUNDARY

EXPLANATION:

MW-2 ●	MONITORING WELL NUMBER AND APPROXIMATE LOCATION
AMPSS1 ⊗	SAMPLE NUMBER AND APPROXIMATE LOCATION
– – – –	ORDINARY HIGH WATER MARK
	GRASS AND BLACKBERRY BUSHES
	TREES
UST	UNDERGROUND STORAGE TANK
—x—x—	FENCE
mg/kg	MILLIGRAMS PER KILOGRAM
Pb	LEAD
Cr	CHROMIUM
Cd	CADMIUM
DEPTH	SAMPLE DEPTH IN FEET BELOW GROUND SURFACE
1,360	EXCEEDS MTCA METHOD B CLEANUP LEVEL FOR SOIL, UNLESS OTHERWISE NOTED
2,640	SAMPLES AMPSS1 AND AMPSS5 EXCEED MTCA METHOD C CLEANUP LEVEL FOR SOIL

0 50 100

APPROXIMATE SCALE IN FEET

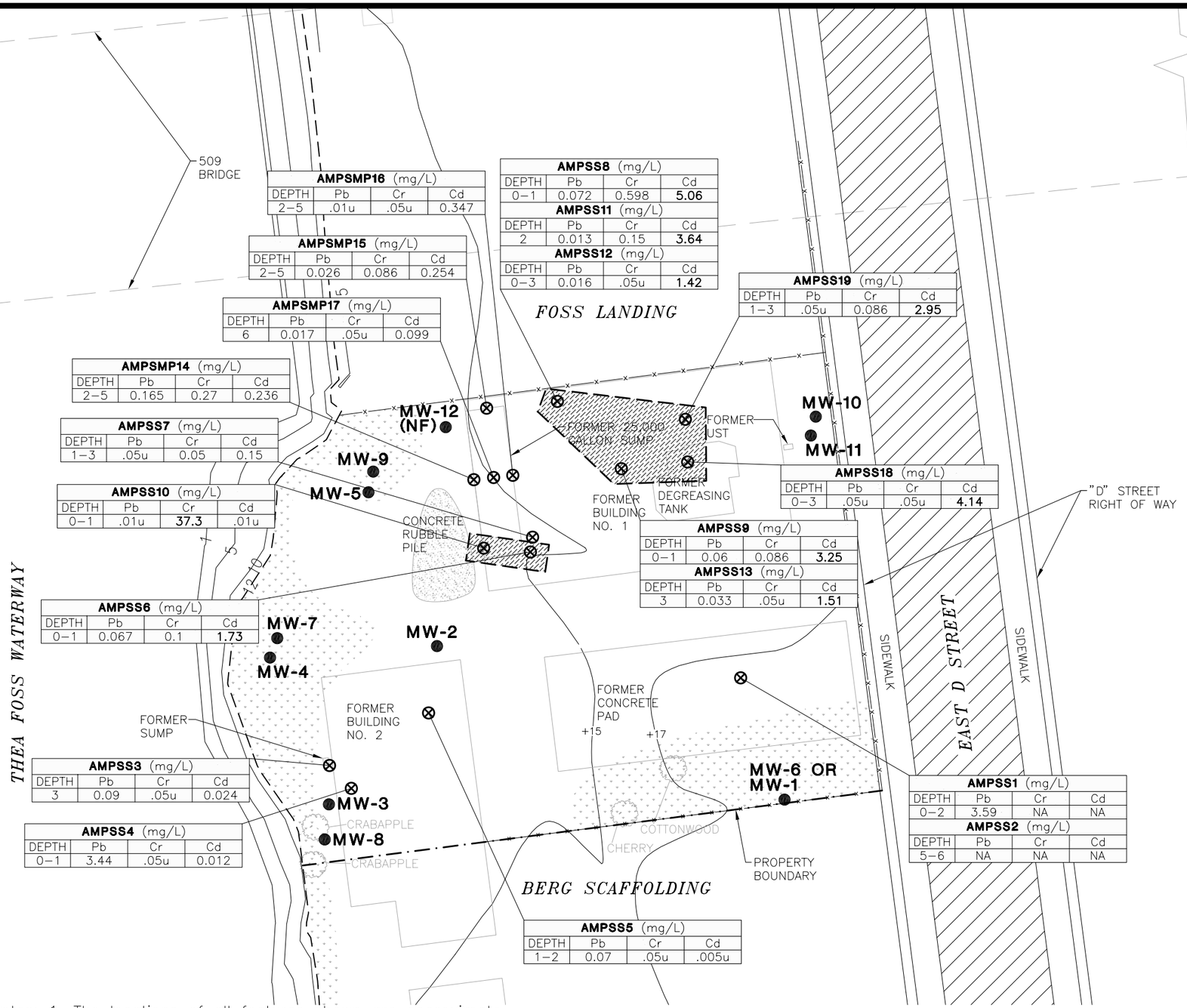
Notes:
1. The locations of all features shown are approximate.
2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.
3. Elevation datum shown is Mean Lower Low Water (MLLW).

Reference: Information and sample locations provided by Marv Coleman, Ecology Personal Communication November 10, 2003.

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INTERIM ACTION TOTAL METALS

FIGURE 3



EXPLANATION:

MW-2 ●	MONITORING WELL NUMBER AND APPROXIMATE LOCATION
AMPSS1 ⊗	SAMPLE NUMBER AND APPROXIMATE LOCATION
▨	REMOVAL AREAS BASED ON TCLP RESULTS
– – – –	ORDINARY HIGH WATER MARK
▭	GRASS AND BLACKBERRY BUSHES
○	TREES
UST	UNDERGROUND STORAGE TANK
—x—x—	FENCE
mg/L	MILLIGRAMS PER LITER
Pb	LEAD
Cr	CHROMIUM
Cd	CADMIUM
DEPTH	SAMPLE DEPTH IN FEET BELOW GROUND SURFACE
u	UNDETECTED AT VALUE SHOWN
NA	NOT ANALYZED
5.06	EXCEEDS DANGEROUS WASTE THRESHOLD UNDER DANGEROUS WASTE REGULATIONS CHAPTER 173–303–090 WAC

0 50 100
APPROXIMATE SCALE IN FEET

Notes:
1. The locations of all features shown are approximate.
2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.
3. Elevation datum shown is Mean Lower Low Water (MLLW).

Reference: Information and sample locations provided by Marv Coleman, Ecology Personal Communication November 10, 2003.

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INTERIM ACTION TCLP METALS

FIGURE 4

11/25/03 GRL:TCM:SCY

TACO\10\1075100200\00\CAD\1075100200_FIG-2_3_4_5_6.dwg

APPENDIX A

INTERIM ACTION PLAN SAIC 2003

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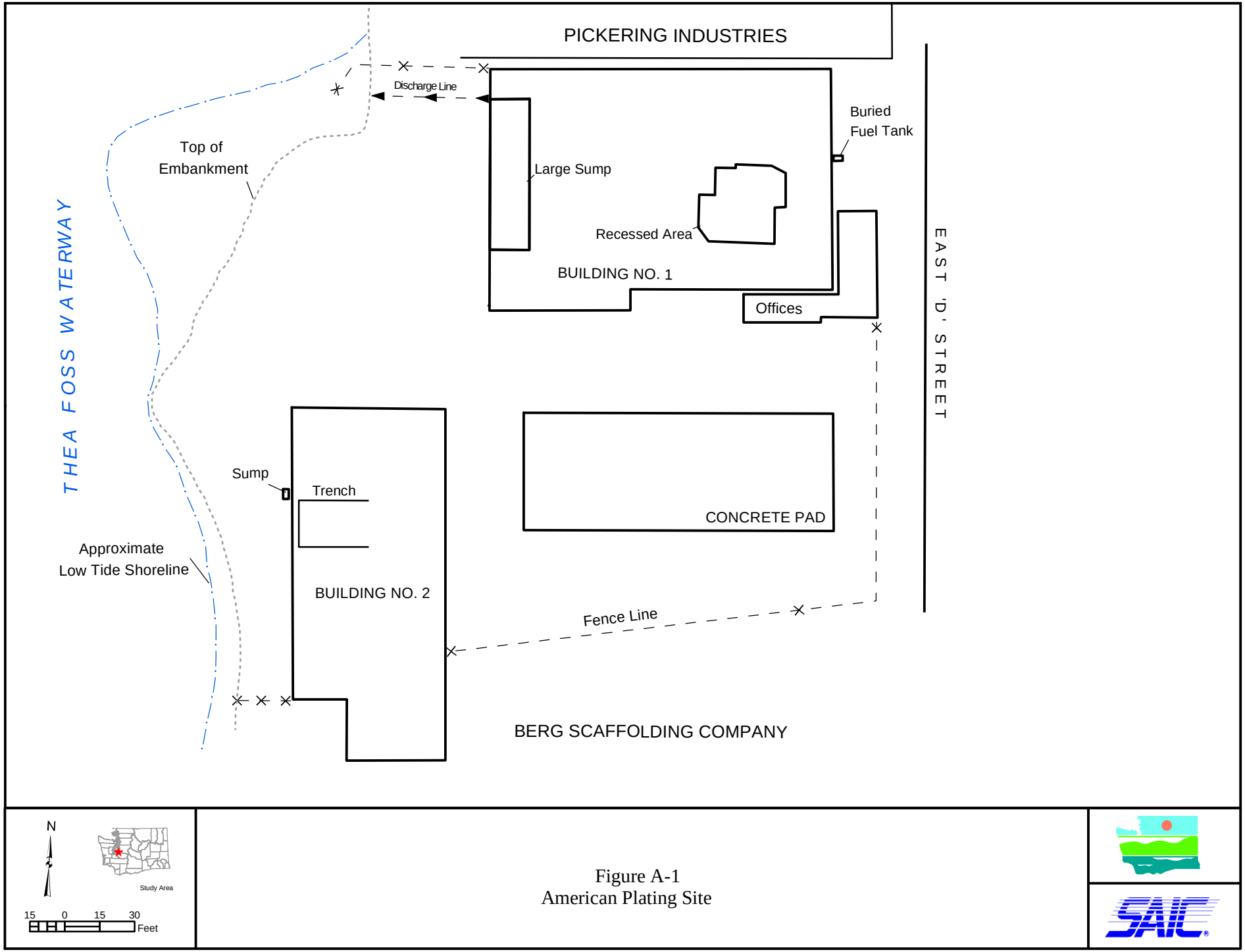


Figure A-1
American Plating Site

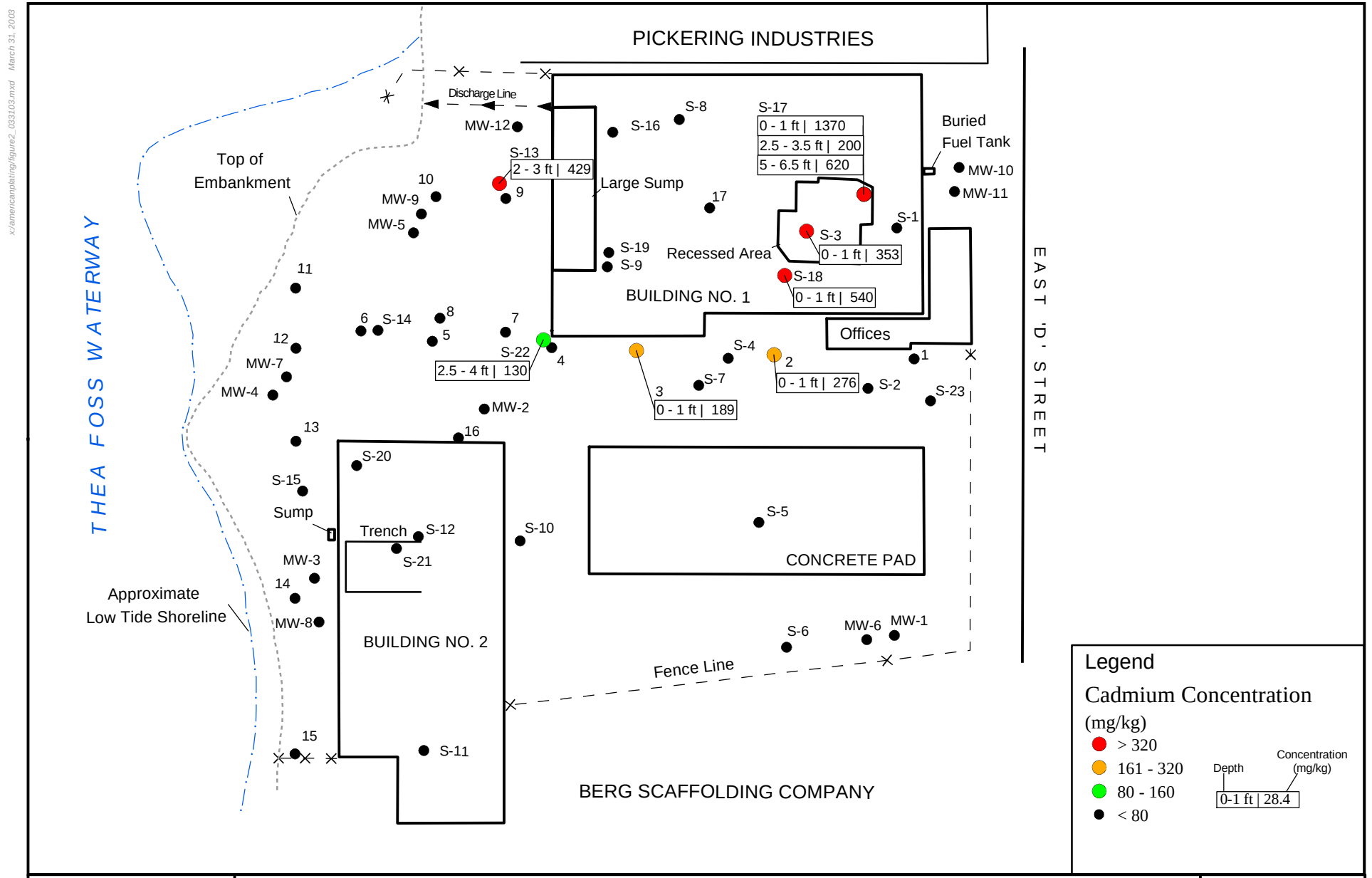


Figure A-2
Cadmium Concentrations in Soil

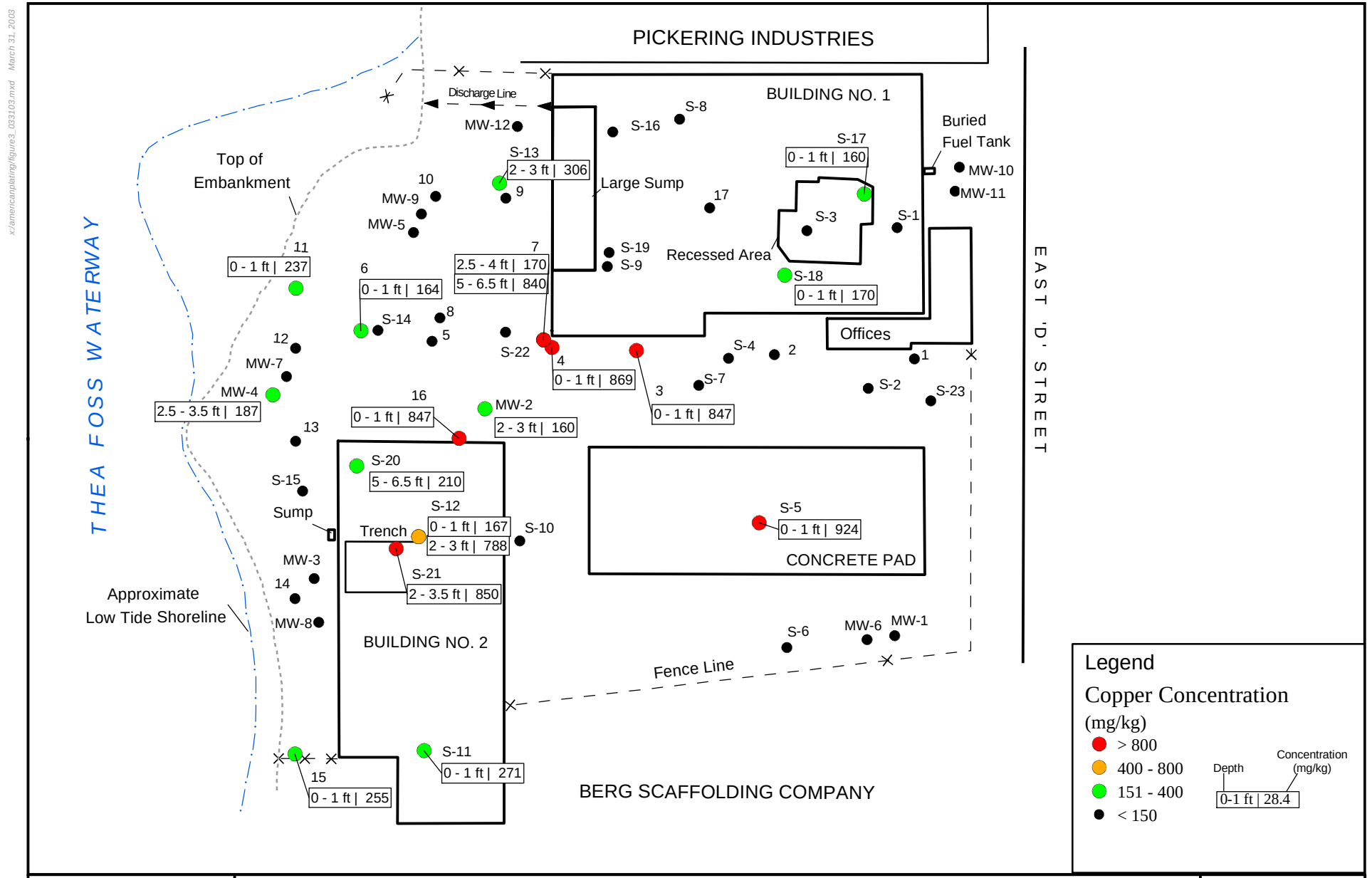


Figure A-3
Copper Concentrations in Soil

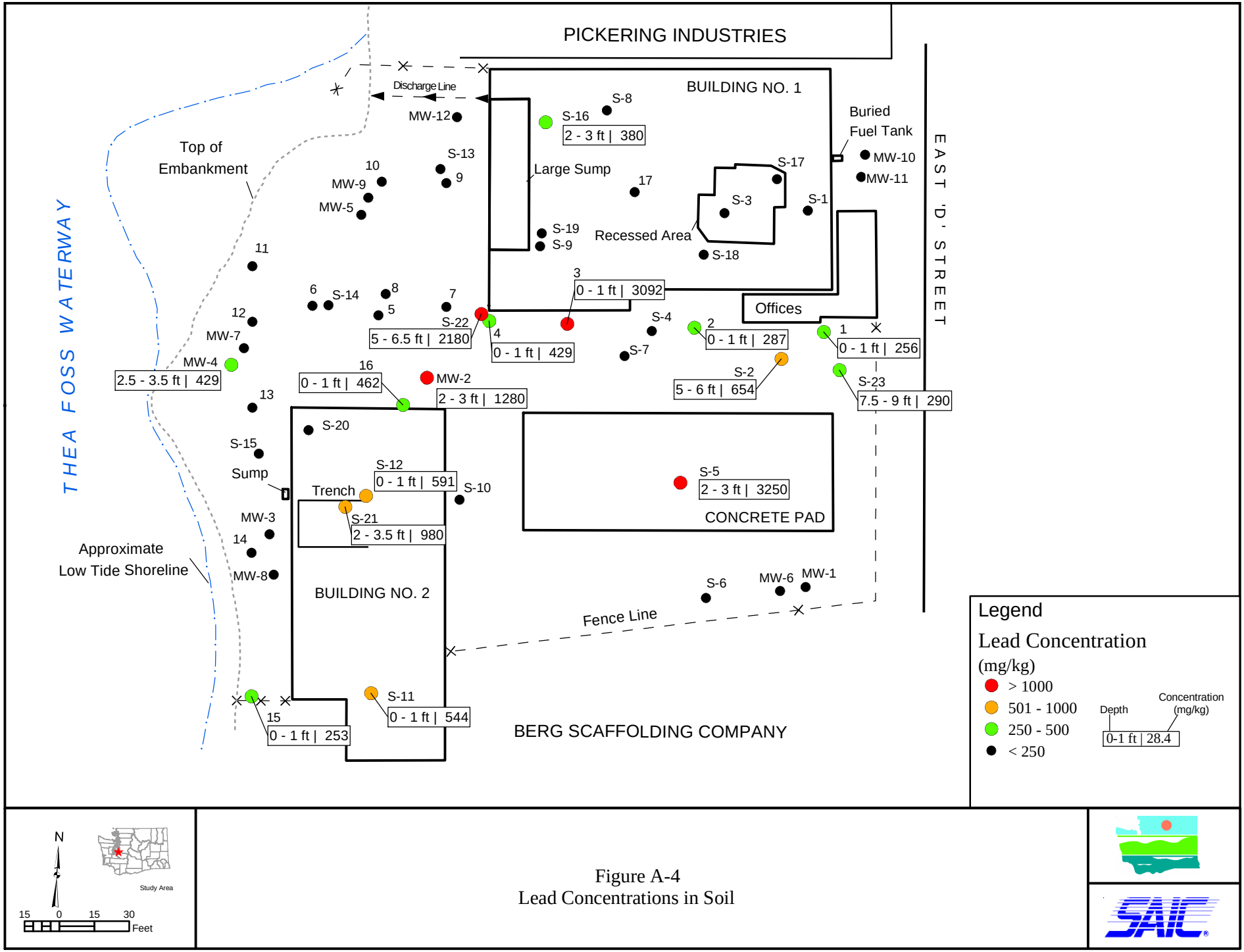


Figure A-4
Lead Concentrations in Soil

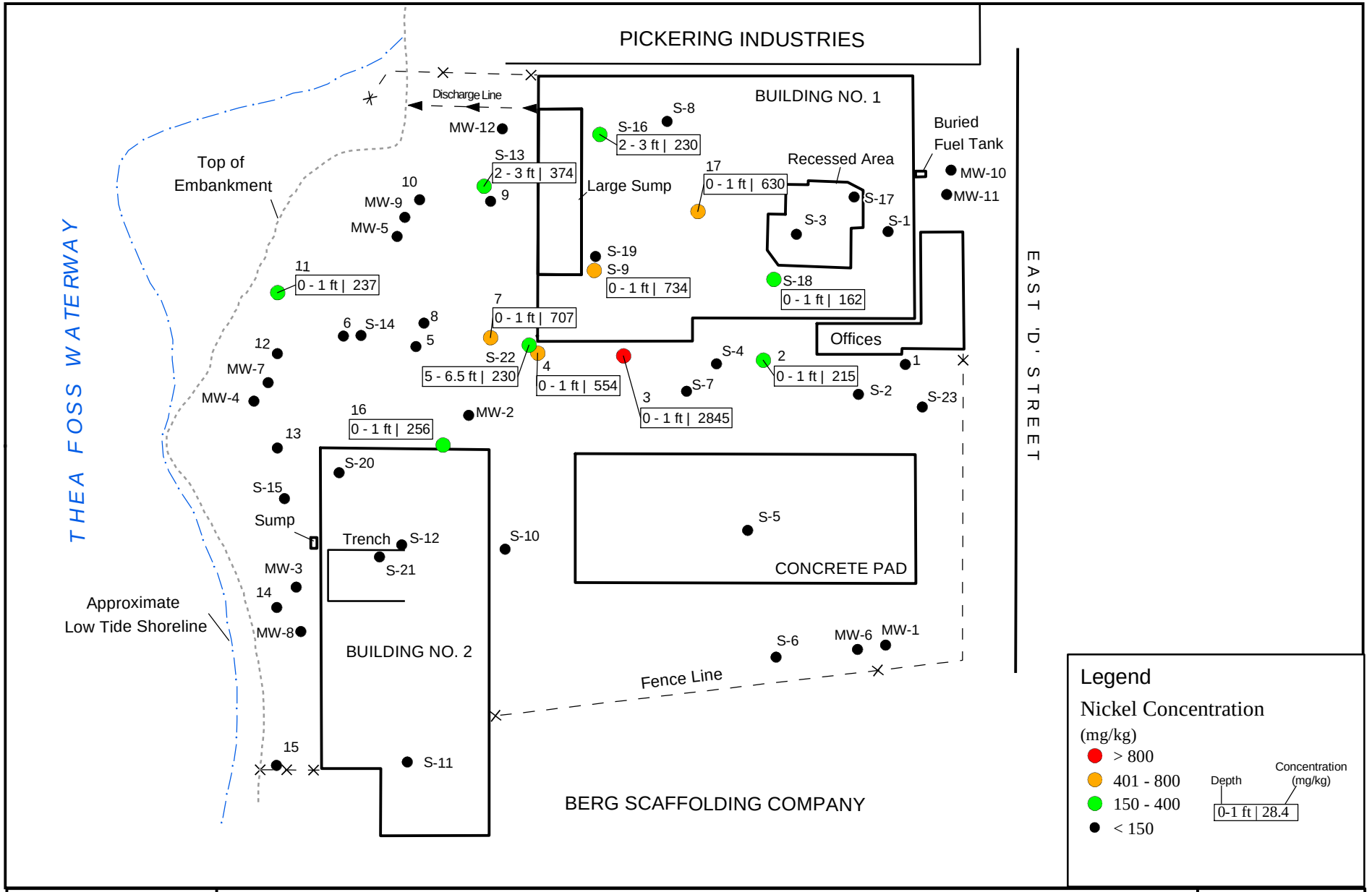


Figure A-5
Nickel Concentrations in Soil

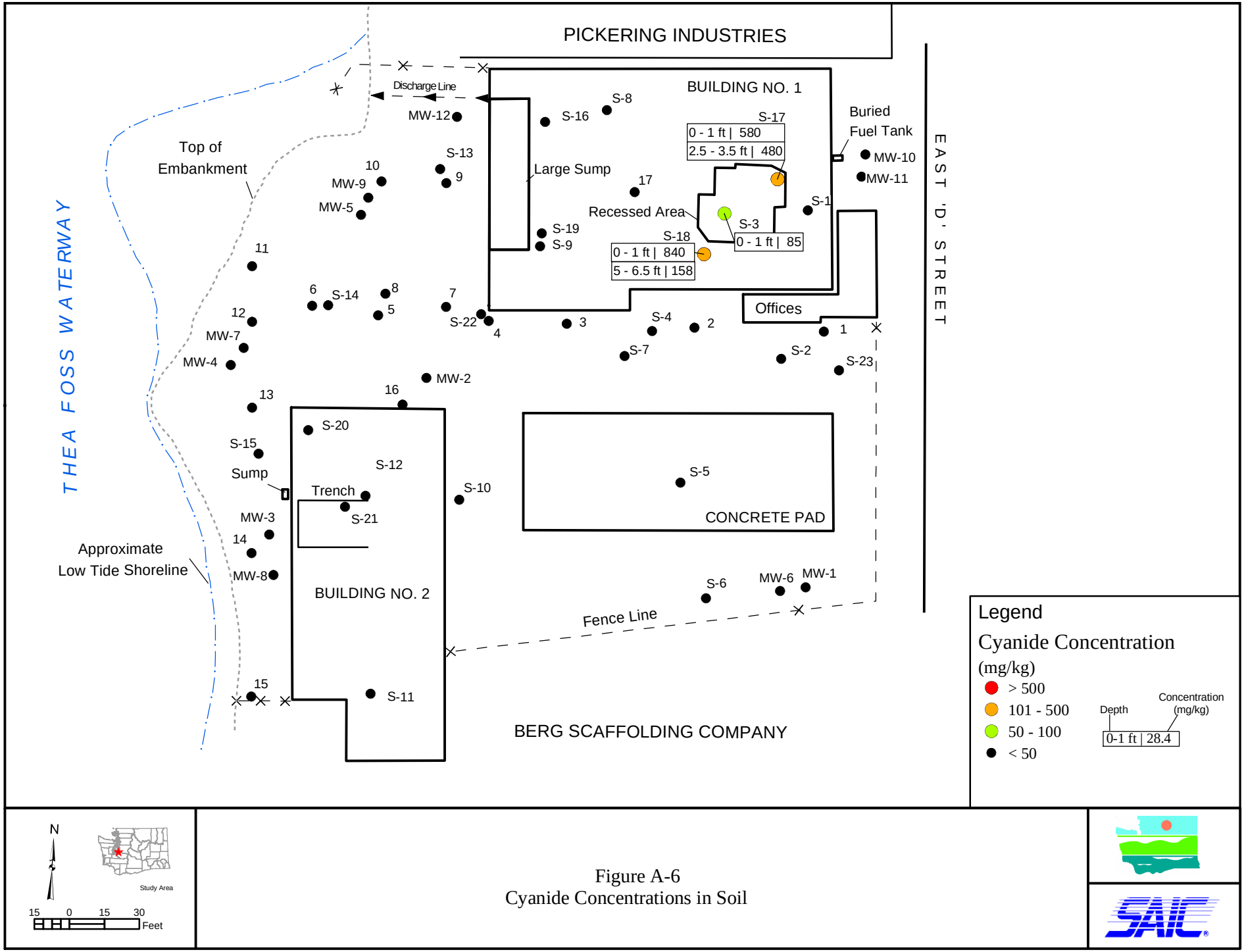


Figure A-6
Cyanide Concentrations in Soil

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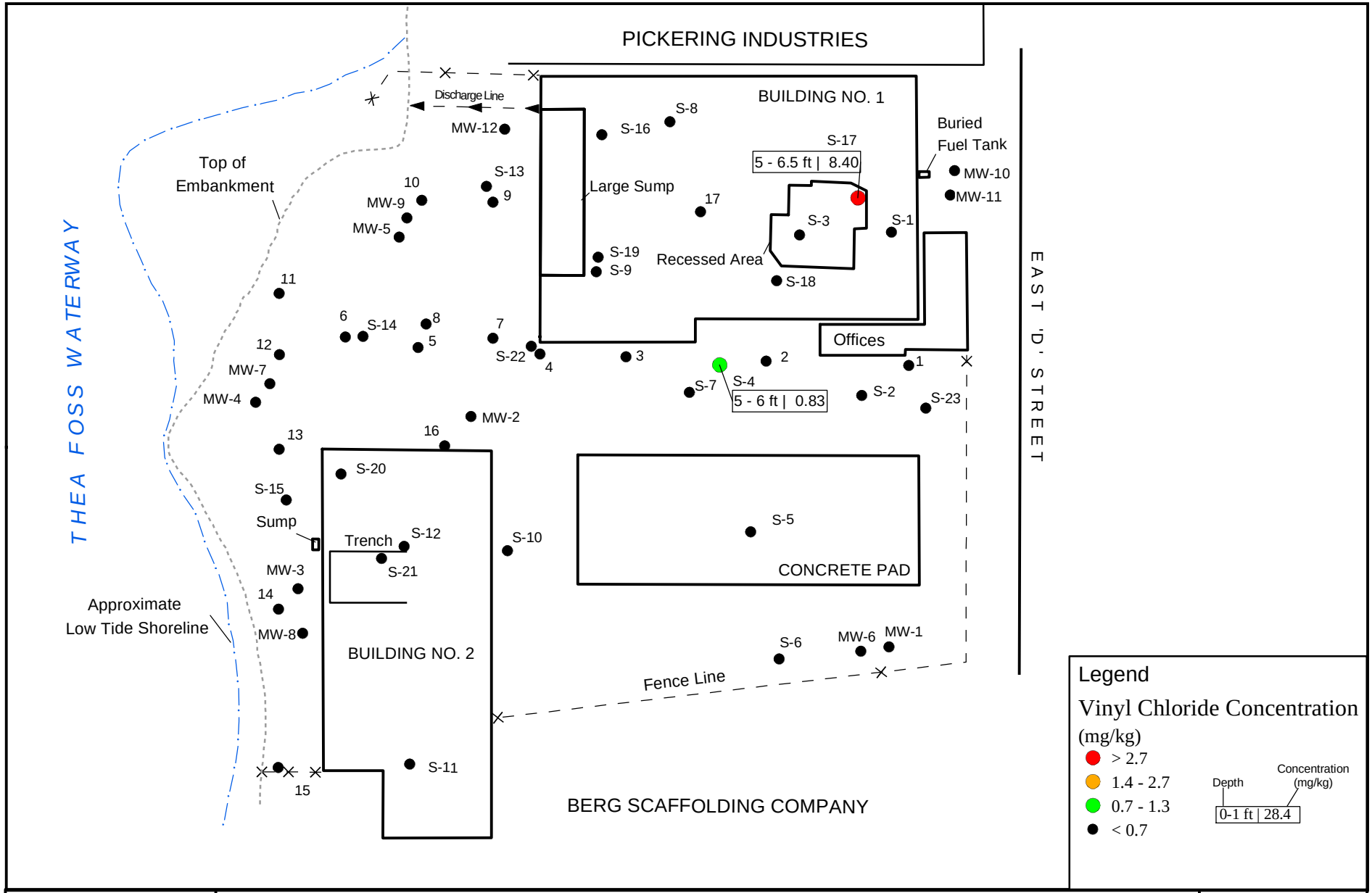


Figure A-7
Vinyl Chloride Concentrations in Soil

ATTACHMENT 3
Groundwater Monitoring Results

DEPARTMENT OF
ECOLOGY
State of Washington

American Plating
Post-Interim-Action
Groundwater Monitoring Results

April and October, 2010

February 2011
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American Plating
Post-Interim-Action
Groundwater Monitoring Results

April and October, 2010

by

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Waterbody Number: WA-10-0030

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Abstract

This report is one in a series that describes groundwater monitoring results at the former American Plating site located on the Thea Foss Waterway in Tacoma, Washington.

During April and October 2010, The Washington State Department of Ecology (Ecology) collected groundwater samples from four site monitoring wells. The samples provide groundwater data on dissolved metals (cadmium, chromium, hexavalent chromium, copper, and nickel) and weak acid dissociable (WAD) cyanide.

Due to the proximity of the site to the waterway, Ecology developed the groundwater cleanup levels based on protection of human contact with surface water (MTCA Method B surface water levels) and on protection of marine organisms (WAC 173-201A). The point of compliance for the groundwater cleanup levels is along the banks of the waterway where groundwater discharges to the surface water.

Results for 2010 were below cleanup levels for dissolved cadmium (9.3 ug/L), copper (3.1 ug/L), and nickel (8.2 ug/L). Dissolved chromium concentrations were below the state marine water quality standard for protection of aquatic organisms for acute exposure to hexavalent chromium of 50 ug/L. WAD cyanide was detected once in one well just above the reporting limit of 5 ug/L. WAD cyanide was not detected in any of the other samples. The reporting limit for WAD cyanide is above the cleanup level of 1 ug/L established for this site.

A further reduction in measured concentrations may occur due to natural processes such as sorption and tidal dispersion as groundwater flows toward the point of compliance.

The Foss Waterway Development Authority plans to eventually develop this area as a public park.

Introduction

Background

The American Plating Company operated a metal electroplating facility adjacent to the Thea Foss Waterway in Tacoma, Washington (Figure 1) beginning in 1976. The site had been occupied by plating companies since 1955. American Plating ceased production at the site in 1986 due to violations of Washington State's dangerous waste regulations[1].

In 1986 the U.S. Environmental Protection Agency (EPA) conducted a preliminary site assessment and concluded that high concentrations of plating waste and contaminated materials were present throughout the site. Based on these and previous findings by the Washington State Department of Ecology (Ecology), formal removal of waste materials and site cleanup activities began in June 1987. Additional soil and groundwater investigations were conducted between 1988 and 1994. In 1997, the site was ranked on Ecology's Hazardous Site List as a "2" (rank of 1 is highest priority relative to other statewide sites; 5 is lowest).

In 2003 Ecology initiated an interim action cleanup of the site. This was done to reduce (1) the potential human health risk from contact with contaminated soils and (2) the potential ecological risk to aquatic organisms in the waterway from the discharge of contaminated groundwater. Contaminants of concern at the site included cadmium, chromium, copper, nickel, cyanide, and volatile organic compounds (VOCs). The cleanup included the removal of site buildings, a concrete pad, sumps, an underground storage tank, and soils designated as dangerous waste (Figure 2). Clean fill and topsoil were added to excavated areas (SAIC, 2003). A metals-contaminated, concrete rubble pile, remaining on-site after the interim cleanup, was removed in June 2007.

Remediation of any remaining contaminated site soils will be performed under a final cleanup action plan when the Foss Waterway Development Authority develops the site as a public park.

Ecology is currently monitoring the site groundwater until the final cleanup action is developed. Data provided from this monitoring will help determine the final cleanup remedy.

[1] The Department of Ecology conducted several site inspections between 1980 and 1985. These inspections showed that discharges, leaks, and spills of brass, cadmium, chromium, copper, nickel, and zinc plating materials had occurred at the site during operations by American Plating and prior site operators.

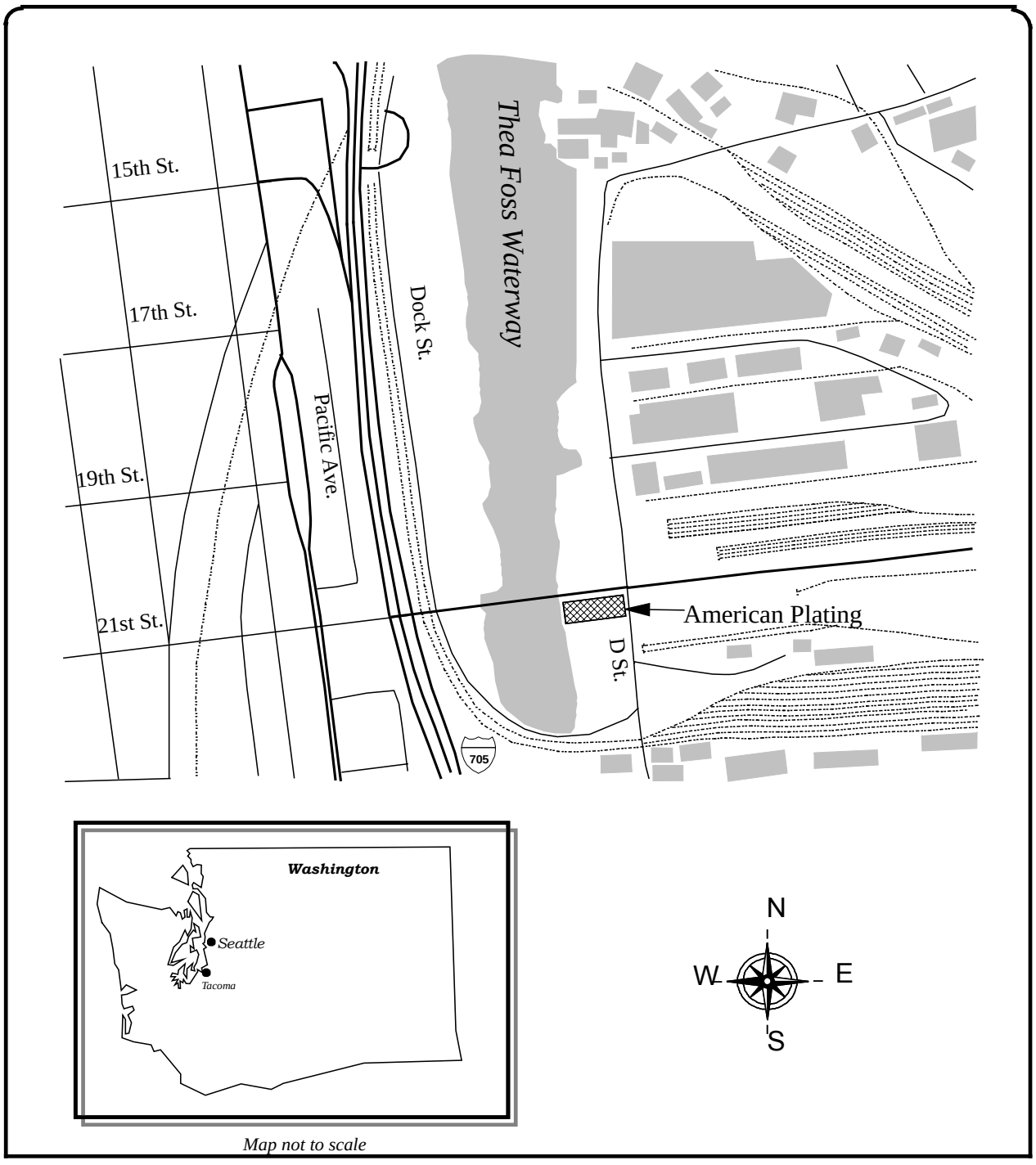


Figure 1. American Plating Site Location in Tacoma, Washington.

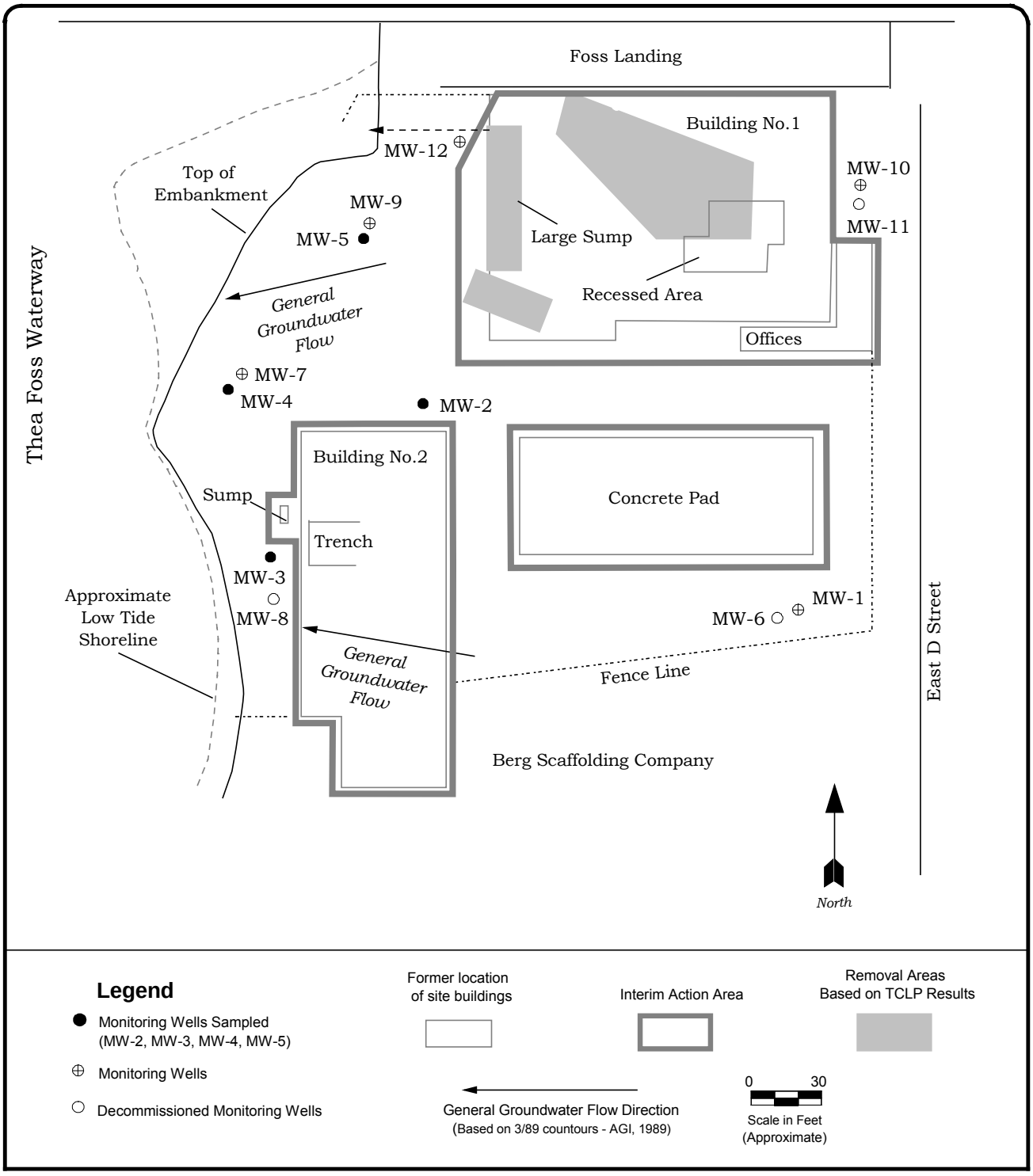


Figure 2. American Plating Sampling Site Locations.

Hydrogeology

Site geology was described during initial site characterization efforts and includes, from the surface down: fill materials, undifferentiated fill and marsh deposits, deltaic deposits, and glacial till.

Prior to site excavation, the fill materials were heterogeneous, consisting of gravels, silty sand, and wood debris to a depth of 5 to 18 feet below the surface. The undifferentiated fill and marsh deposits consist of very soft, sandy silts to clayey silts. These silts were generally encountered around 3 to 12 feet below the surface, and ranged up to 15 feet thick (SAIC, 1994; PRC, 1995).

The deltaic deposits contain medium-dense, silty sand and silty gravel about 5 feet thick, encountered at a depth of about 18 feet. These deposits appear to be relatively continuous beneath the site and seem to thicken to the northwest across the site.

Till is generally encountered at depths of about 23 to 29 feet, with an unknown thickness, and consists of slightly consolidated, very dense, silty sand to silty gravel.

Aquifers exist in both the unconfined fill/marsh deposits and the deltaic deposits. The deltaic deposits contain a semi-confined sand aquifer. The two aquifers are interconnected and tidally influenced. The relationship between the two aquifers and the waterway is complex. High salinity has been measured in much of the site groundwater (SAIC, 2003). Vertical flow components between the two aquifers are difficult to establish because of the complicated stratigraphy and tidal influence at the site.

The unconfined water table in the fill/marsh aquifer ranges from approximately 5 to 9 feet below ground surface. Groundwater flow is interpreted to be in a general westerly direction towards the Thea Foss Waterway. However, the hydraulic gradient in the unconfined aquifer may reverse at high tide phases, at least beneath the western portion of the site.

Methods

Groundwater Monitoring

Ecology collected groundwater samples from four monitoring wells in April and October 2010 (Figure 2). Previous investigations showed no contamination in the lower semi-confined aquifer; therefore, Ecology samples taken since 2004 have been limited to wells screened in the upper unconfined aquifer. The goal of the sampling is to continue to monitor post-interim-action groundwater concentrations of dissolved metals (cadmium, chromium, hexavalent chromium, copper, and nickel) and WAD cyanide.

The four wells sampled (MW-2, MW-3, MW-4, and MW-5) were completed in the upper fill/marsh deposits aquifer at depths of about 14.5 to 17 feet. The wells have 5-foot screened intervals at the base.

Ecology measured static water levels in all wells prior to well purging and sampling. Measurements were collected according to standard operating procedure (SOP) EAP052 (Marti, 2009).

The monitoring wells were purged and sampled using a peristaltic pump with dedicated tubing for each well. The tubing intake was placed at the middle of the screened interval. Wells were purged at a rate of 0.5-liter/minute or less through a continuous flow cell until pH, temperature, and specific conductance readings stabilized and turbidity readings decreased. Dissolved oxygen (DO) was measured at the end of purging using a field test kit. Purge water from the wells was collected and stored on site in a 55-gallon drum. Purge water waste transport and disposal procedures followed Washington State regulations (Chapter 173-303-400 WAC).

At the completion of purging, Ecology collected samples directly from the discharge tubing into laboratory-supplied containers. Non-dedicated tubing in the pump head was replaced between wells.

Metal samples were field-filtered, with a clean, high-capacity, in-line 0.45 micron membrane filter, into a 1/2-liter, high-density polyethylene container and preserved with nitric acid to a pH < 2. Hexavalent chromium samples were field-filtered into a 125-mL polyethylene bottle and preserved with sodium hydroxide to a pH of 9. WAD cyanide samples were collected in a 250-mL amber polyethylene bottle and preserved with sodium hydroxide to a pH of 12.

After collection and labeling, samples were stored in an ice-filled cooler. To meet the analytical method holding time of 24 hours, the hexavalent chromium samples were delivered to the contract laboratory directly following sampling. The remaining samples were transported to Ecology's Operation Center in Lacey, where they were kept in the walk-in cooler until transported by courier to the Ecology/EPA Manchester Environmental Laboratory in Manchester, Washington. Chain-of-custody procedures were followed (Ecology, 2008).

Analysis

Analytes, analytical methods, and reporting limits for both field and laboratory parameters are listed in Table 1. Groundwater samples were analyzed for selected dissolved metals (cadmium, chromium, hexavalent chromium, copper, and nickel), WAD cyanide, and VOCs.

Table 1. Field and Laboratory Methods.

Field Measurements	Instrument Type	Method	Accuracy
Water Level	Solinst Water Level Meter	SOP EAP052	±0.03 feet
pH	YSI ProPlus with Quatro Cable	EPA 150.1 (EPA, 2001a)	±0.2 std. units
Temperature	YSI ProPlus with Quatro Cable	EPA 150.1	±0.2 ºC
Specific Conductance	YSI ProPlus with Quatro Cable	EPA 120.1 (EPA, 2001b)	±10 µmhos/cm
Turbidity	HF Scientific DRT-15C Meter	EPA 180.1 (EPA, 1994b)	±2 NTU
Dissolved Oxygen	Chemetrics Colormetric Kit	Rhodazine D	RL: 0-1 mg/L
Laboratory Analytes	**Reference**	**Method**	**Reporting Limit**
Dissolved Metals	EPA 1996	EPA Method 200.8	0.02-1.0 ug/L
Dissolved Hexavalent Chromium	APHA 1992	SM 3500-Cr D	5 ug/L
WAD Cyanide	APHA 1998	SM 4500CN-I	5 ug/L

EAP: Environmental Assessment Program.

RL: Reporting Limit.

Results

Data Quality Assessment

Quality control samples collected in the field consisted of blind duplicate samples, which were obtained from well MW-3 during both rounds of sampling. Field duplicates were collected by splitting the pump discharge between two sets of sample bottles, which provides a measure of the overall sampling and analytical precision.

Precision estimates are influenced not only by the random error introduced by collection and measurement procedures but also by the natural variability of the concentrations in the media being sampled. The numeric comparison of duplicate results is expressed as the relative percent difference (RPD). The RPD is calculated as the difference between sample results, divided by the mean and expressed as a percent. Table 2 shows the results of the duplicate samples and the RPD for samples collected from well MW-3.

Table 2. Relative Percent Difference (RPD) of Duplicate Sample Results (µg/L) for April and October 2010.

Well Sample ID	Dissolved Cadmium		Dissolved Chromium		Dissolved Hexavalent Chromium		Dissolved Copper		Dissolved Nickel		WAD Cyanide	
	4/10	10/10	4/10	10/10	4/10	10/10	4/10	10/10	4/10	10/10	4/10	10/10
MW-3	0.2 U	0.2 U	10.8 J	9.99 J	5 U	10 U	2.33	1.55	1 U	4.89	5 U	5.1
MW-3A	0.2 U	0.2 U	9.74 J	6.28 J	5 U	10 U	2.69	2.00	1 U	5.79	5 U	8.4
RPD (%)	--	--	--	--	--	--	14%	25%	--	17%	--	49%

MW-3A: The duplicate sample identification.

The RPDs in April and October 2010 ranged from 14% to 25%, with the exception of WAD cyanide in October with a RPD of 49%. The October RPD for WAD cyanide data was more than double the data quality objective of 20% (Marti, 2004a). However, WAD cyanide has been detected in this well once before at a concentration of 7 ug/L; therefore, the data will be reported as estimated. The October RPD for copper was also slightly above the data quality object of 20% for metals; therefore, the copper data has also been "J" qualified as estimated.

A review of the data quality control and quality assurance from laboratory case narratives indicates that, overall, laboratory analytical performance was acceptable. The reviews include descriptions of analytical methods, holding times, instrument calibration checks, blank results, surrogate recoveries, and laboratory control samples. The dissolved chromium data have been qualified as estimates because routine calibration verification checks were slightly outside the acceptance limit. The lab did not encounter any other difficulties during analysis; all other checks, as well as the calibration correlation coefficients, were acceptable.

The October hexavalent chromium samples were diluted prior to analysis due to high turbidity which increased the reporting limit.

The quality of the remaining data is acceptable and usable as qualified. Quality assurance case narratives and laboratory reporting sheets are available from the author upon request.

All field measurements and analytical results are available in electronic format from Ecology's Environmental Information Management (EIM) System database: www.ecy.wa.gov/eim/index.htm at study ID, AMERPLAT.

Field Results

Table 3 displays depth-to-water measurements in each sampled well prior to purging. Table 3 also presents pH, dissolved oxygen, specific conductance, and turbidity readings measured at the time of sampling. Temperature was measured but, because readings are from water moving through a flow cell which is influenced by ambient conditions, the values provide a comparative measurement useful to indicate well stabilization, but not true groundwater conditions. Therefore temperature measurements are not presented.

Table 3. Summary of Field Parameter Results for April and October 2010.

Monitoring Well	Total Depth (feet)[1]	Depth-to-Water (feet)[1]				pH (standard units)		Dissolved Oxygen (mg/L)		Specific Conductance (umhos/cm)		Turbidity (NTU)	
		Time	4/10	Time	10/10	4/10	10/10	4/10	10/10	4/10	10/10	4/10	10/10
MW-2	16.65	09:09	5.38	13:28	6.53	6.5	6.8	0.2	0.25	2,570	2,470	13	2.5
MW-3	14.67	09:13	2.92	09:00	4.30	6.6	6.6	0.4	0.2	21,610	20,240	0.8	0.2
MW-4	16.89	08:58	4.86	10:42	6.50	7.0	6.9	0.15	--	8,990	17,700	0.2	0.4
MW-5	16.84	09:02	5.98	12:15	7.21	7.2	7.4	0.4	0.35	21,670	21,660	0.4	0.7

[1] Measured from top of PVC casing.

Figure 3 shows the tidal phase when water levels were measured and samples were collected. The April monitoring occurred during a low tide and the October monitoring occurred during a rising tide. Samples collected at or near low tide are assumed to be more representative of groundwater conditions flowing toward the waterway. Depth-to-groundwater ranged from 2.92 to 5.98 feet below the measuring points in April, and 4.30 to 7.21 feet in October. Groundwater elevations ranged from about 9 to 12 feet above mean sea level during the two sample rounds.

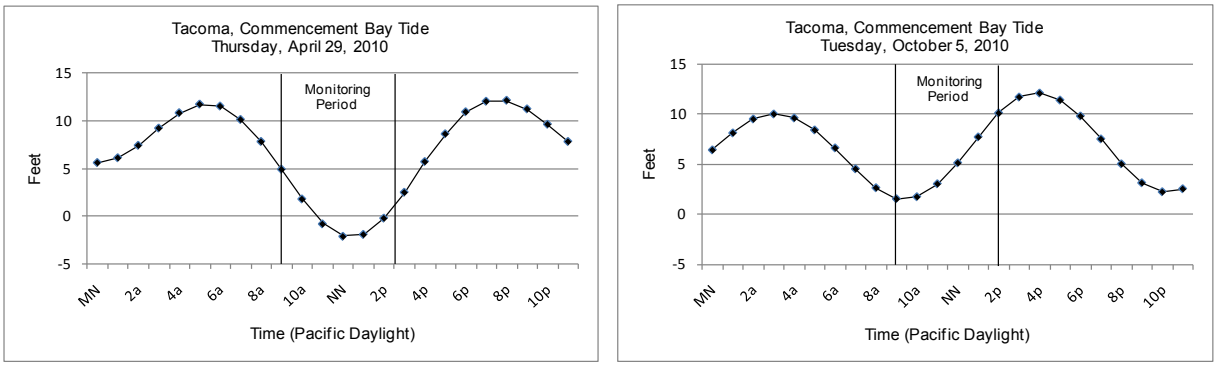


Figure 3. Tide Phase for April 29 and October 5, 2010.

Screened in the soft sandy silt, silt, and clayey silt of the fill/marsh deposits, the four sampled wells are low yielding. While purging at the lowest flow possible, water levels dropped in all wells an average of one to six feet in April and October. Purge volumes ranged from 3.5 to 4 gallons during the two sample events.

During the monitoring period, groundwater pH ranged from 6.5 to 7.4. Dissolved oxygen measurements were low, ranging from 0.15 to 0.4 mg/L, indicative of anaerobic or reducing conditions. Specific conductance measurements ranged from 2,470 to 21,670 umhos/cm. Specific conductance values for wells closer to the Thea Foss Waterway were higher, consistent with the close proximity to salt water. Specific conductance of the Waterway has been reported between 15,000 and 35,000 umhos/cm (SAIC, 1994.) Turbidity measurements ranged from 0.2 to 13 NTUs. Groundwater temperatures measured in the flow cell ranged from 11.2 to 12.7 ºC in April and 14.3 to 16.0 ºC in October.

Analytical Results

Analytical results for dissolved metals and WAD cyanide are summarized in Table 4 and presented in Figure 4. A summary of historical data for this project is presented in tables and graphs in Appendix A.

Table 4. Summary of Analytical Results (ug/L) for April and October 2010.

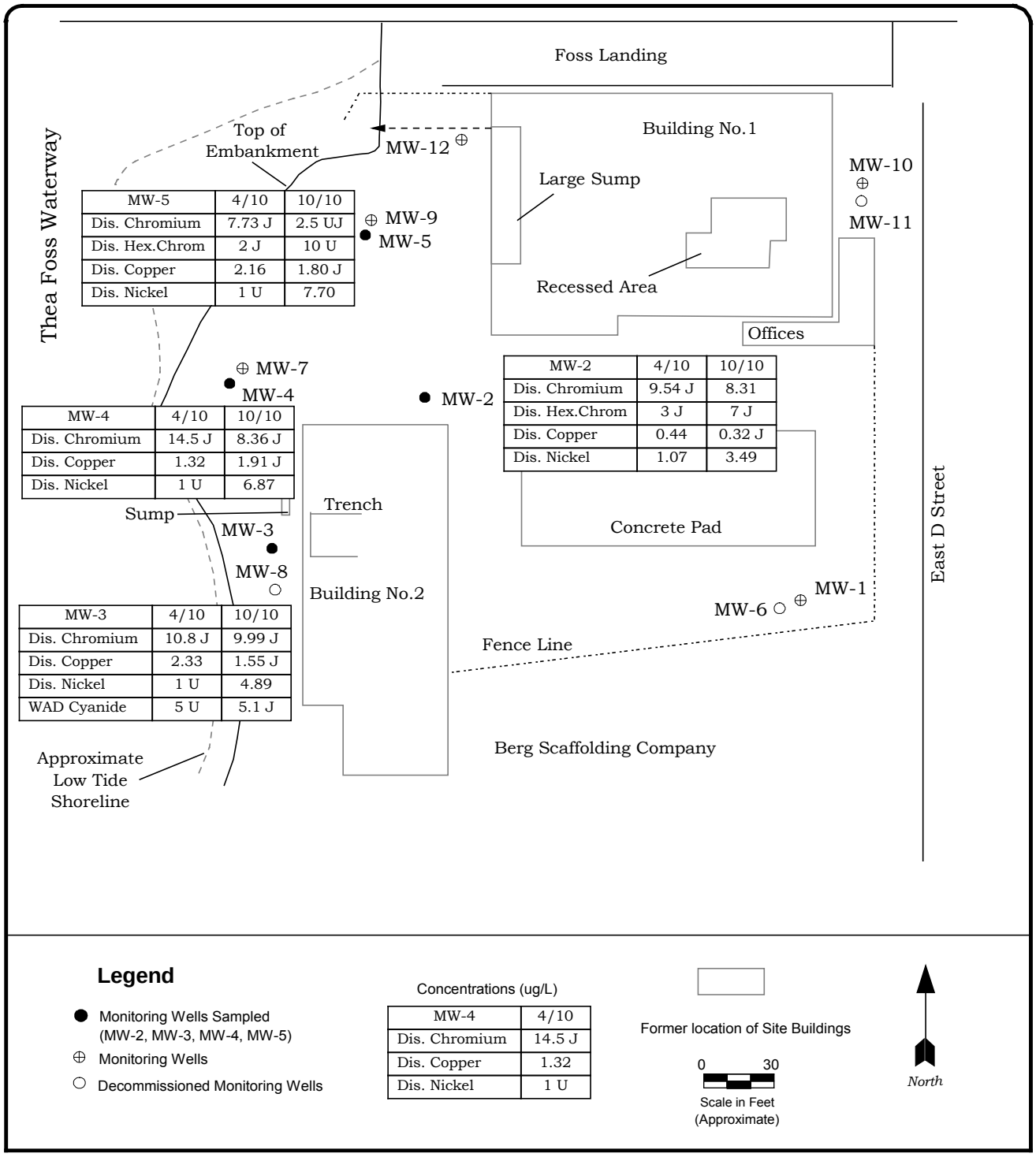
Well	Dissolved Cadmium		Dissolved Chromium		Dissolved Hexavalent Chromium		Dissolved Copper		Dissolved Nickel		WAD Cyanide	
	4/10	10/10	4/10	10/10	4/10	10/10	4/10	10/10	4/10	10/10	4/10	10/10
MW-2	0.02 U	0.2 U	**9.54 J**	**8.31**	**3 J**	**7 J**	**0.44**	**0.32 J**	**1.07**	**3.49**	5 U	5 U
MW-3	0.2 U	0.2 U	**10.8 J**	**9.99 J**	5 U	10 U	**2.33**	**1.55 J**	1 U	**4.89**	5 U	**5.1 J**
MW-4	0.2 U	0.2 U	**14.5 J**	**8.36 J**	5 U	10 U	**1.32**	**1.91 J**	1 U	**6.87**	5 U	5 U
MW-5	0.2 U	0.2 U	**7.73 J**	2.5 UJ	**2 J**	10 U	**2.16**	**1.80 J**	1 U	**7.70**	5 U	5 U

U: Analyte was not detected at, or above, the reported value.
J: Analytical result is an estimate.
Bold: Analyte was detected.

Dissolved chromium, copper, and nickel were detected at low concentrations in the groundwater samples.

Dissolved hexavalent chromium was detected in samples from wells MW-2 and MW-5 at an estimated concentration range of 2 to 7 ug/L. Hexavalent chromium was detected in these two wells in May 2008 at similar concentrations.

WAD cyanide was detected in the October sample from well MW-3 just above the reporting limit of 5 ug/L. Samples from wells MW-3 and MW-4 tested positive for sulfide during both sample rounds. The presence of sulfide can interfere with cyanide analysis and bias the results low. As in the past the April and October cyanide samples were preserved with sodium hydroxide to a pH of 12. Cyanide converts to thiocyanate in the presence of sulfide and high pH. Therefore, the results for samples from wells MW-3 and MW-4 may be under reported due to sulfide interference.



MW-5	4/10	10/10
Dis. Chromium	7.73 J	2.5 UJ
Dis. Hex.Chrom	2 J	10 U
Dis. Copper	2.16	1.80 J
Dis. Nickel	1 U	7.70

MW-4	4/10	10/10
Dis. Chromium	14.5 J	8.36 J
Dis. Copper	1.32	1.91 J
Dis. Nickel	1 U	6.87

MW-2	4/10	10/10
Dis. Chromium	9.54 J	8.31
Dis. Hex.Chrom	3 J	7 J
Dis. Copper	0.44	0.32 J
Dis. Nickel	1.07	3.49

MW-3	4/10	10/10
Dis. Chromium	10.8 J	9.99 J
Dis. Copper	2.33	1.55 J
Dis. Nickel	1 U	4.89
WAD Cyanide	5 U	5.1 J

MW-4	4/10
Dis. Chromium	14.5 J
Dis. Copper	1.32
Dis. Nickel	1 U

Figure 4. American Plating Summary of Analytical Results (ug/L).

Discussion

Low concentrations of the sampled metals continue to be detected in groundwater samples from the American Plating site. Table 5 shows a comparison of the 2010 analytical results to numerical cleanup levels established for the site.

Table 5. Comparison of 2010 Groundwater Results (ug/L) to Surface-Water Based Cleanup Levels.

Parameter	American Plating Cleanup Levels (ug/L)	Monitoring Wells			
		MW-2	MW-3	MW-4	MW-5
Dissolved Metals					
Cadmium	9.3	0.02 U - 0.2 U	0.2 U	0.2 U	0.2 U
Chromium	--	8.31 - 9.54 J	9.99 J - 10.8 J	8.36 J – 14.5 J	2.5 UJ - 7.73 J
Copper	3.1	0.32 J – 0.44	1.55 J - 2.33	1.32 - 1.91 J	1.80 J – 2.16
Hexavalent Chromium	--	3 J – 7 J	5 U – 10 U	5 U – 10 U	2 J – 10 U
Nickel	8.2	1.07 - 3.49	1 U – 4.89	1 U – 6.87	1 U - 7.70
WAD Cyanide	1	5 U	5 U – 5.1 J	5 U	5 U

U: Analyte was not detected at, or above, the reported value.
J: Analyte was positively identified. The associated numerical result is an estimate.

Due to the proximity of the site to the Thea Foss Waterway, the groundwater cleanup levels were developed based on protection of human health due to contact with surface water (MTCA Method B surface water levels) and on protection of marine organisms (WAC 173-201A) for the groundwater-to-surface-water pathway. The surface water cleanup level for cyanide (1 ug/L for acute exposure) is based on the WAD cyanide.

A summary of historical data for this project is presented in tables and graphs in Appendix A.

Sampling for WAD cyanide began in 2004 and was detected in well MW-4 from 2006 to 2008 and well MW-5 in 2007 and 2008. It was not detected in these wells in 2009 or 2010. WAD cyanide was detected in the October 2010 sample from well MW-3. Sulfide is consistently detected in wells MW-3 and MW-4, and to a lesser extent well MW-5. The presence of sulfide in samples collected from wells MW-3 and MW-4 may interfere with the cyanide analysis and bias the results low. Also the available reporting limit for WAD cyanide of 5 ug/L exceeds the cleanup level of 1 ug/L established for this site. Total cyanide was detected in wells MW-2, MW-3, MW-4, and MW-10 in samples collected from 1988 to 1994 as shown in Appendix A.

In 2004, dissolved chromium concentrations in wells MW-4 and MW-5 exceeded Washington State surface water quality standard for protection of aquatic organisms in marine waters for acute exposure to hexavalent chromium of 50 ug/L (WAC 173-201A). Since it was not possible to determine which form of chromium (trivalent or hexavalent) was present, samples have been collected and analyzed for hexavalent chromium since August 2005. Dissolved hexavalent chromium was not detected in any samples until May 2008. The 2008 samples were

inadvertently analyzed using EPA methods 218.5 and 200.7 revision 4.4. The samples were reported to contain estimated concentrations of 1.6 to 8 ug/L hexavalent chromium, which is below the state surface water quality standard. Dissolved hexavalent chromium was again detected in the 2010 samples from wells MW-2 and MW-5 at an estimated concentration range of 2 to 7 ug/L.

Before removal of the metals-contaminated concrete rubble pile, dissolved chromium concentrations in samples collected between February 2004 and April 2007 from wells MW-2, MW-3, MW-4, and MW-5 had an average range of 25 to 150 ug/L. Since removal of the rubble pile in June 2007, concentrations have decreased significantly as seen in Figure A2 in the Appendix. Average concentrations from September 2007 to October 2010 ranged from 12 to 20 ug/L.

Summary of Results

Cleanup levels for the American Plating site were based on Washington State surface water quality standards with the point of compliance for groundwater being the areas where groundwater discharges to surface water along the bank of the Thea Foss Waterway. Groundwater concentrations measured in the site monitoring wells are considered the conditional point of compliance. With the exception of cyanide and an occasional nickel result, most groundwater concentrations meet (are below) the cleanup levels established for the point of compliance since Ecology began monitoring in 2004.

Sample results in 2010 were below cleanup levels for dissolved cadmium, copper, and nickel. Dissolved chromium results are below state surface water quality standards. WAD cyanide was detected in well MW-3 above the cleanup level, but results in the other wells were reported as non-detect. However, the available analytical reporting limit of 5 ug/L is above the cleanup level of 1 ug/L established for this site.

It is assumed that a further reduction in measured concentrations may occur due to natural processes of sorption and tidal dispersion as the groundwater flows toward the point of compliance (GeoEngineers, 2003).

Conclusions

Dissolved chromium, copper, and nickel continue to be detected at low concentrations in groundwater samples collected at the former American Plating site. With the exception of an occasional nickel and WAD cyanide result, most concentrations are below the regulatory site cleanup levels. However, a further reduction in measured concentrations may occur due to natural attenuation processes as groundwater flows toward the regulatory point of compliance along the banks of the waterway.

Recommendations

As a result of this study, the following recommendations are made.

1. The condition of monitoring wells MW-2 and MW-3 has declined. To prevent further damage, new concrete pads, bollards, or some other protective barrier should be installed at these wells and any of the wells located near planned construction activities.

2. Well MW-10 was part of the monitoring program from February 2004 until it was damaged in 2006. This well should be located and properly decommissioned.

3. Responsibility for compliance monitoring should be transferred to the Foss Waterway Development Authority once park development is underway.

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Appendices

Appendix A. Historical Data

Table A-1. Historical Dissolved Metals and Total Cyanide Results (ug/L) from April 1988 to September 1994.

Well ID	LR Jones				EPA	LR Jones		PRC
	5/88	8/88	11/88	2/89	2/89	3/89	12/93	9/94
MW-2								
Cadmium	4 U	--	--	--	5 U	--	0.5 U	2 U
Chromium	10 U	--	--	--	10 U	--	10 U	5 U
Copper	20 U	--	--	--	25 U	--	10 U	3 U
Nickel	20 U	--	--	--	17 U	--	10 U	**19 P**
Total Cyanide	10 U	**20**	**20**	**20**	5 U	**10**	**9**	**13**
MW-3								
Cadmium	4 U	--	--	--	5 U	--	0.2 U	--
Chromium	10 U	--	--	--	10 U	--	10 U	--
Copper	20 U	--	--	--	25 U	--	10 U	--
Nickel	**20**	--	--	--	17 U	--	10 U	--
Total Cyanide	10 U	10 U	10	10 U	5 U	**10**	**27**	--
MW-4								
Cadmium	4 U	--	--	--	5 U	--	0.5 U	10 U
Chromium	10 U	--	--	--	10 U	--	10 U	25 U
Copper	20 U	--	--	--	25 U	--	10 U	15 U
Nickel	20 U	--	--	--	17 U	--	10 U	50 U
Total Cyanide	10 U	**30**	**30**	**20**	5 U	**10**	**9**	**15**
MW-5								
Cadmium	4 U	--	--	--	5 U	--	0.4 U	--
Chromium	10 U	--	--	--	10 U	--	10 U	--
Copper	20 U	--	--	--	**41.9**	--	10 U	--
Nickel	20 U	--	--	--	17 U	--	**28**	--
Total Cyanide	10 U	10 U	10	10 U	5 U	10 U	5 U	--
MW-10								
Cadmium	--	--	--	--	--	--	0.5 U	--
Chromium	--	--	--	--	--	--	10 U	--
Copper	--	--	--	--	--	--	10 U	--
Nickel	--	--	--	--	--	--	**110**	--
Total Cyanide	--	--	--	--	--	**40**	**24**	--

--: Not sampled.
Bold: Analyte was detected.
U: Analyte was not detected at, or above, the reported value.
P: Analyte was detected but at a concentration between the instrument detection limit and the quantitation limit.
LR Jones: (PRC, 1995).
PRC: PRC Environmental Management.

Table A-2. Dissolved Metals and WAD Cyanide Results (ug/L) for Well MW-10, February 2004 to August 2005.

Well ID	Ecology			
	Feb-04	Aug-04	Mar-05	Aug-05
MW-10				
Cadmium	--	0.2 U	**0.32**	**0.026**
Chromium	--	**25.5**	2.5 U	**9.1 J**
Hexavalent Chromium	--	--	--	2 UJ
Copper	--	1 U	1 U	1 U
Nickel	--	**62.2**	**40.3**	**29**
WAD Cyanide	10 U	10 U	10 U	5 U

--: not sampled.
Bold: Analyte was detected.
U: Analyte was not detected at, or above, the reported value.
Shaded values are higher than Cleanup Levels established for the site.

Table A-3. Dissolved Metals and WAD Cyanide Results (ug/L) from February 2004 to October 2010.

Well ID	Ecology													
	Feb-04	Aug-04	Mar-05	Aug-05	May-06	Sep-06	Apr-07	Sep-07	May-08	Sep-08	May-09	Nov-09	April-10	Oct-10
MW-2														
Cadmium	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U	**0.022**	0.2 U	0.02 U	0.02 U	**0.027**	0.2 U	0.2 U	0.02 U	0.2 U
Chromium	**8.2**	**30.2**	**18**	**21**	**49.9**	**16.1**	**28**	**28.4**	**11.2**	**6.9 J**	**15.3**	**7.24**	**9.54 J**	**8.31**
Hex Chromium	--	--	--	2 UJ	5 U	5 U	5 U	REJ	**8 J**	5 U	5 U	50 U	**3 J**	**7 J**
Copper	1 U	1 U	1 U	1 U	1 U	**0.39**	1 U	**0.48**	**1.1**	1 U	1 U	1 U	**0.44**	**0.32 J**
Nickel	**4.3**	**4.4**	**3.7**	**3.1**	**2.8**	**3.3**	**2.3**	**5.96**	**13.3**	**4 J**	**3.92**	**4.03**	**1.07**	**3.49**
WAD Cyanide	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	REJ	5 U	5 U	5 U	5 U	5 U
MW-3														
Cadmium	0.2 U	0.2 U	**0.48**	0.2 U	0.2 U	0.2 U	**0.26**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	**12.2***	**24***	**16**	**28**	**30.6**	**25**	**180**	**33.2**	**7.6**	**9.6 J**	**9.78**	**10.9**	**10.8 J**	**9.99 J**
Hex Chromium	--	--	--	2 UJ	5 U	5 U	5 U	REJ	**3.2 J**	5 U	5 U	50 U	5 U	10 U
Copper	**1.4***	**2.7**	**2.5**	**3.6**	**2.5 J**	**2.8 J**	**1.35 J***	**2.5**	**2.1**	**2.9**	**1.26**	**2.43 J**	**2.33**	**1.55 J**
Nickel	**8.6***	**5.8**	**6.6**	**4.8**	**3.8**	1 U	1 U	**4.1**	**6**	**2.3 J**	**1.88**	**5.09**	1 U	**4.89**
WAD Cyanide	10 U	10 U	10 U	5 U	5 U	5 U	**7**	5 U	REJ	5 U	REJ	5 U	5 U	**5.1 J**
MW-4														
Cadmium	0.2 U	0.2 U	**0.35**	0.2 U	0.02 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	**20**	**54.9**	**51**	**76**	**66.2**	**35.8 J**	**750**	**63.8**	**11**	**9.4 J**	**23.5**	**15.4**	**14.5 J**	**8.36 J**
Hex Chromium	--	--	--	2 UJ	5 U	5 U	5 U	REJ	**4.7 J**	5 U	5 U	**600 J**	5 U	10 U
Copper	1 U	**2.1**	**1.3**	**2.4**	**1.9 J**	**1.6 J**	1 U	**1.1**	1 U	**2.2**	**1.18**	**1.75 J**	**1.32**	**1.91 J**
Nickel	**4.9**	**4.9**	**3.4**	**3.2**	**2.2**	1 U	1 U	**3.1**	**3.7**	1 U	**1.55**	**4.51**	1 U	**6.87**
WAD Cyanide	10 U	10 U	10 U	5 U	**5**	**8**	**11**	**13**	REJ	**6**	REJ	5 U	5 U	5 U
MW-5														
Cadmium	0.2 U	0.2 U	**0.37**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	**30.9**	**71**	**37.7**	**88**	**104**	**40.7**	**170**	**84.1**	**6.2**	**2.8 J**	5 U	**5.74**	**7.73 J**	2.5 UJ
Hex Chromium	--	--	---	2 UJ	5 U	5 U	5 U	REJ	**1.6 J**	5 U	5 U	50 U	**2 J**	10 U
Copper	1 U	**1.5**	**2**	**2.8**	**1.4 J**	**2.4 J**	**1.2**	**1.4**	**1.8**	**3.0**	**2.26**	**2.22 J**	**2.16**	**1.80 J**
Nickel	**14.8**	**11.8**	**9.2**	**7.9**	**3.6**	**1**	1 U	**6.7**	**8.9**	**5 J**	**2.59**	**7.05**	1 U	**7.70**
WAD Cyanide	10 U	10 U	10 U	5 U	5 U	5 U	**6**	**7**	REJ	**3 J**	5 U	5 U	5 U	5 U

--: not sampled.
Bold: Analyte was detected.
*: Average concentration of duplicate samples.
U: Analyte was not detected at, or above, the reported value.
REJ: Results have been rejected.
Shaded values are higher than Cleanup Levels established for the site.

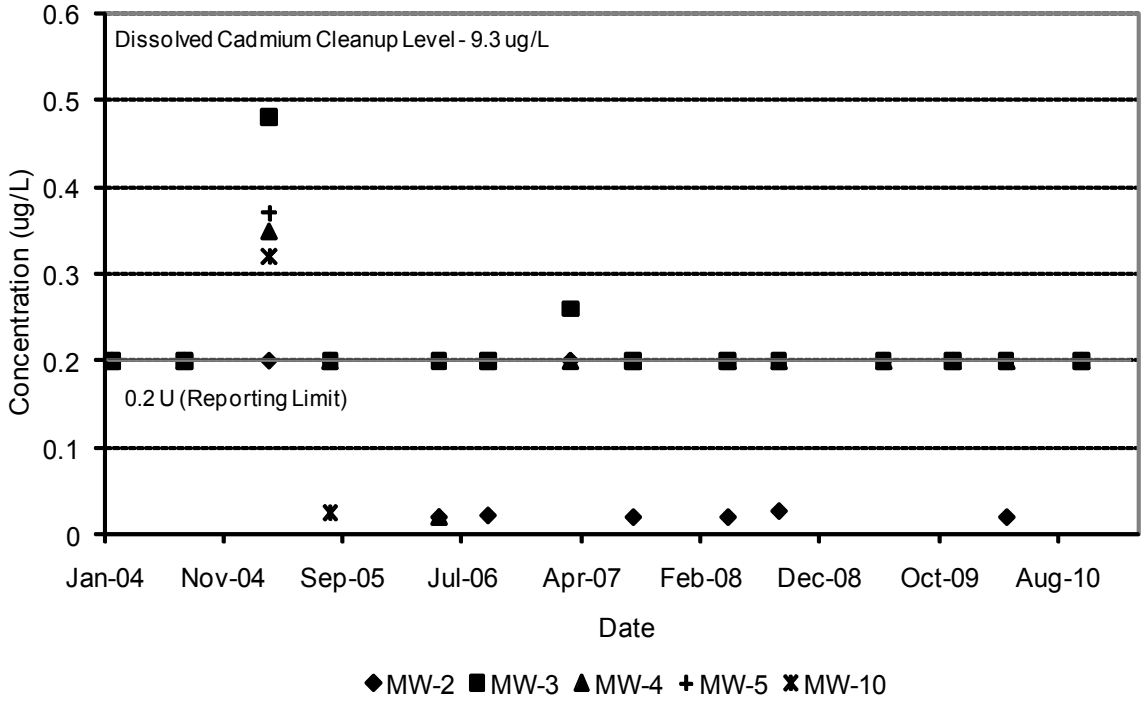


Figure A-1. Dissolved Cadmium Results (ug/L) from February 2004 to October 2010.

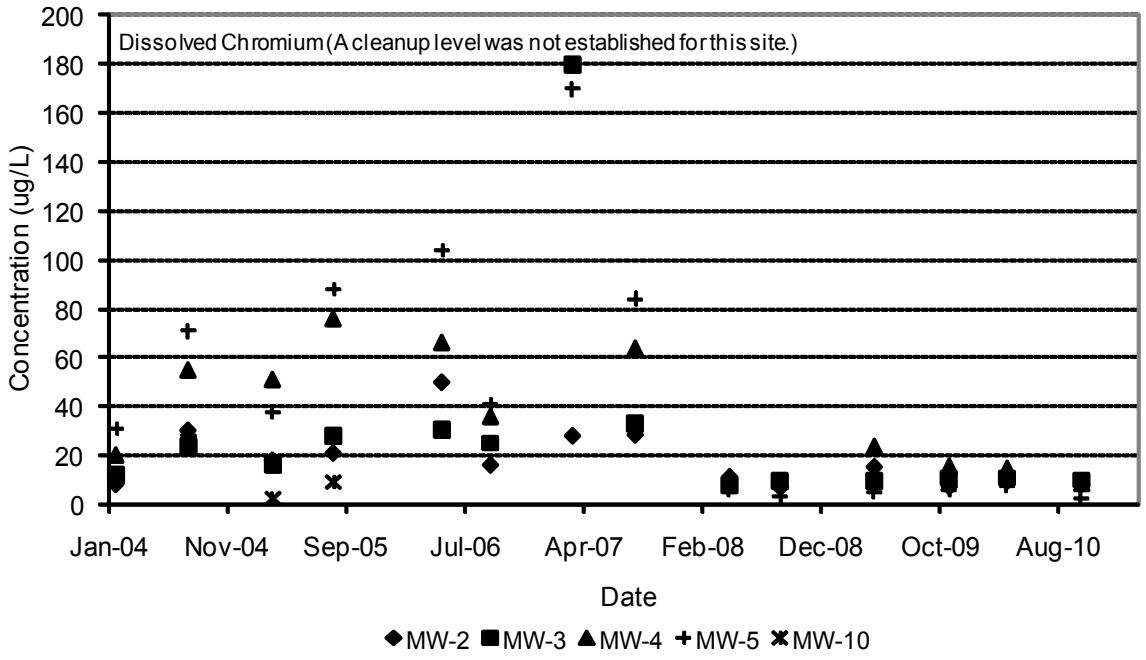


Figure A-2. Dissolved Chromium Results (ug/L) from February 2004 to October 2010.
NOTE: April 2007 MW-4 value of 750 ug/L is not plotted.

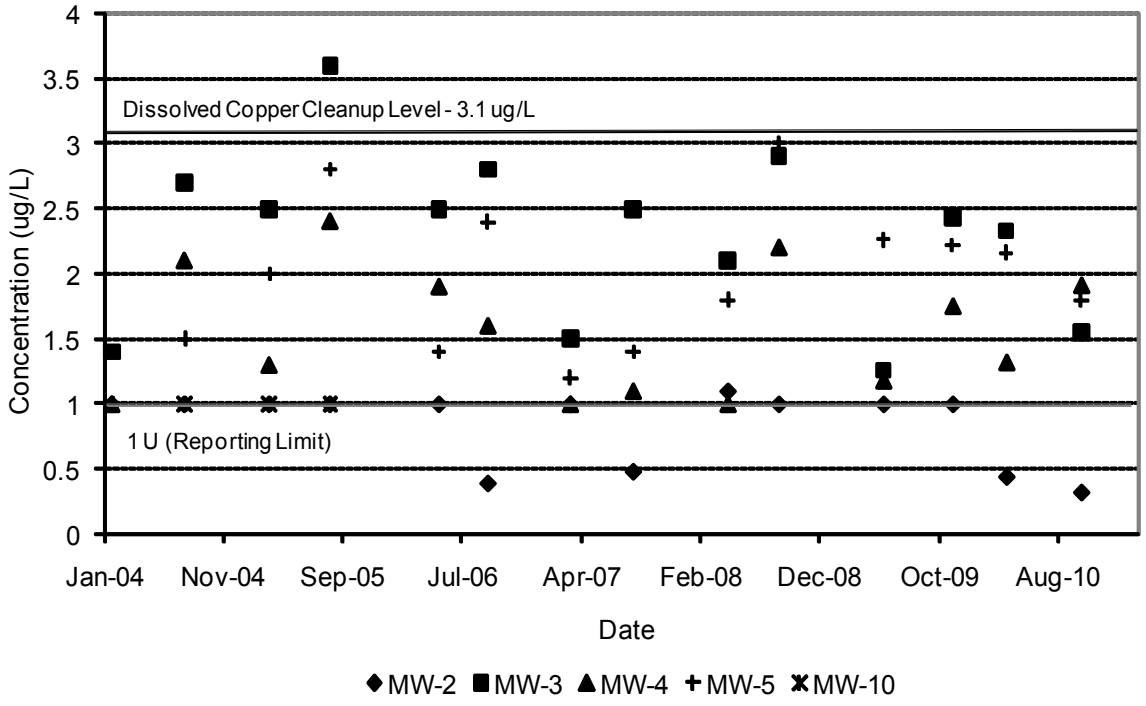


Figure A-3. Dissolved Copper Results (ug/L) from February 2004 to October 2010.

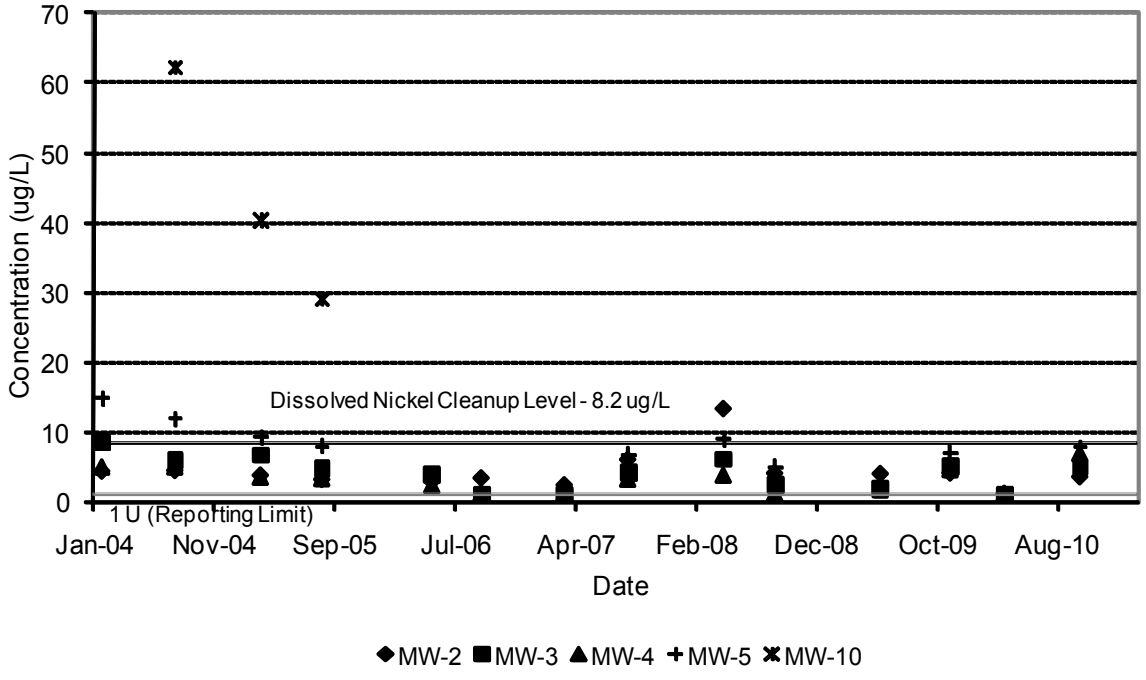


Figure A-4. Dissolved Nickel Results (ug/L) from February 2004 to October 2010.

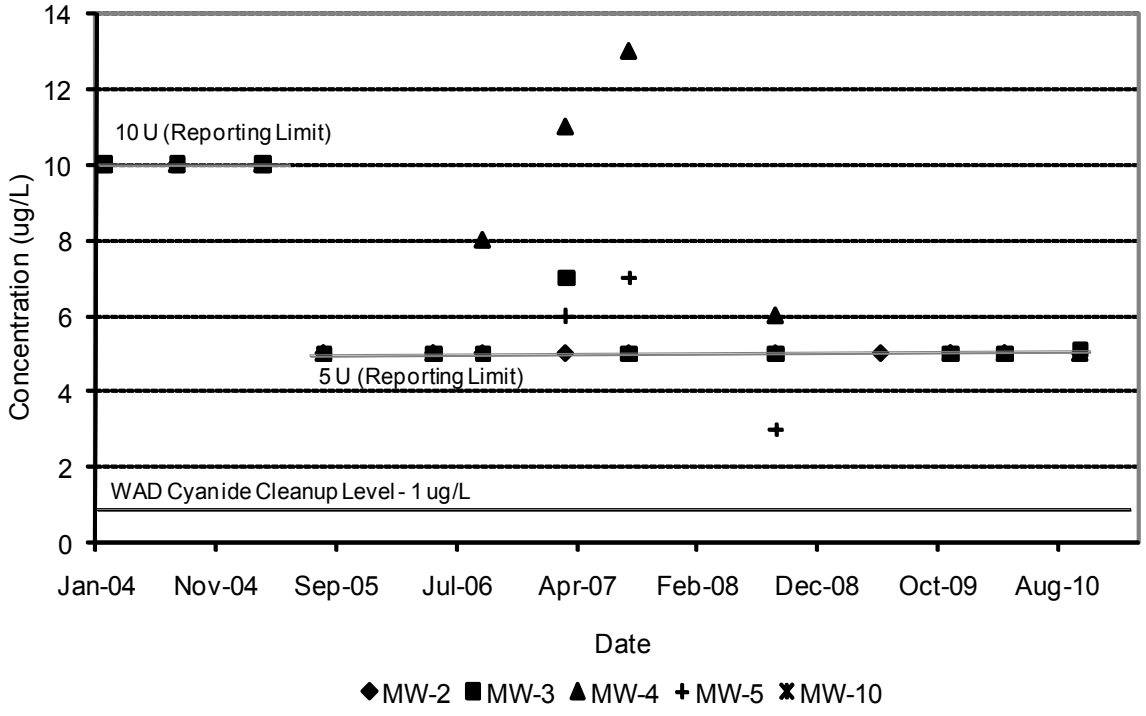


Figure A-5. WAD Cyanide Results (ug/L) from February 2004 to October 2010.

Appendix B. Glossary, Acronyms, and Abbreviations

Glossary

Ambient: Refers to the surrounding air temperature.

Analyte: Water quality constituent being measured (parameter).

Deltaic deposits: The accumulation of sediment at the mouth of a river (delta).

Depth-to-water: A measure of depth to the water (i.e., water level) in a well.

Groundwater: Water in the subsurface that saturates the rocks and sediment in which it occurs. The upper surface of groundwater saturation is commonly termed the water table.

Hydraulic gradient: The difference in hydraulic head between two measuring points, divided by the distance between the two points.

Parameter: Water quality constituent being measured (analyte). A physical, chemical, or biological property whose values determine environmental characteristics or behavior.

pH: A measure of the acidity or alkalinity of water. A low pH value (0 to 7) indicates that an acidic condition is present, while a high pH (7 to 14) indicates a basic or alkaline condition. A pH of 7 is considered to be neutral. Since the pH scale is logarithmic, a water sample with a pH of 8 is ten times more basic than one with a pH of 7.

Semi-confined aquifer: An aquifer partially confined by soil layers of low permeability through which recharge and discharge can still occur.

Sorption: The process in which one substance takes up (absorption) or holds another (adsorption).

Specific conductance: A measure of water's ability to conduct an electrical current. Specific conductance is related to the concentration and charge of dissolved ions in water.

Stratigraphy: Refers to the natural divisions of rocks and their arrangement according to their composition, distribution, correlation, and mutual relationships.

Turbidity: A measure of the amount of suspended silt or organic matter in water.

Unconfined aquifer: An aquifer containing water that is not under pressure; the water level in a well is the same as the water table outside the well.

Acronyms and Abbreviations

Ecology	Washington State Department of Ecology
EIM	Environmental Information Management
EPA	U.S. Environmental Protection Agency
MTCA	Model Toxic Control Act
PVC	Polyvinyl Chloride
RPD	Relative Percent Difference
SOP	Standard Operating Procedure
TCLP	
VOC	Volatile Organics Compound
WAC	Washington Administrative Code
WAD	Weak Acid Dissociable

Units of Measurement

mL	milliliters
NTU	nephelometric turbidity units
ug/L	micrograms per liter (parts per billion)



ATTACHMENT 4
Compliance Monitoring Plan (CMP)

DRAFT

Draft Compliance Monitoring Plan (CMP)

American Plating Site Remediation Project
2110 East D Street
Tacoma, Washington

for
Washington State Department of Ecology

on Behalf of Foss Waterway Development Authority

October 4, 2011

GeoEngineers

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30 YEARS 2010

Draft Compliance Monitoring Plan (CMP)

American Plating Site Remediation Project Tacoma, Washington

File No. 10751-002-01

October 4, 2011

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1.0 INTRODUCTION

This document presents the Compliance Monitoring Plan (CMP) for the remedial action to be performed at the American Plating Site (Site) located at 2110 East D Street, in Tacoma, Washington. The Site is located along the eastern shoreline at the head of the Thea Foss Waterway (Figure 1). The Foss Waterway Development Authority (FWDA) is performing the remedial action under a Perspective Purchaser Consent Decree with the Washington State Department of Ecology (Ecology). The American Plating Facility/Site Identification Number (ID) is 1202 and Cleanup Site ID is 2539.

Remediation activities are being completed in accordance with the Cleanup Action Plan (CAP) (GeoEngineers, 2003) prepared for the Site to address contamination resulting from releases of metals from past metal plating operations at the Site. This CMP has been prepared in accordance with Washington Administrative Code (WAC) 173-340-410 to describe the protection, performance, and confirmation monitoring to be performed to protect human health and the environment and verify the effectiveness of the remedial action. The CMP was developed and is intended to be used in conjunction with the Engineering Design Report (EDR) (GeoEngineers, 2011a) prepared for the American Plating Site.

2.0 BACKGROUND

2.1. Previous Site Investigations

In 1988, 1989, and 1994, a Phase I site assessment, Phase II site investigation and a supplemental groundwater investigation were performed at the Site. These investigations included characterization of soil and groundwater and included installation of 12 monitoring wells (AGI, 1988, 1989 and 1994). Additional groundwater sampling was performed at the Site in January 1995 (PRC, 1995). In 2003, an Interim Action Cleanup (IAC) was performed that included collection and analysis of soil samples (SAIC, 2003). Additionally, starting in 2004, semi-annual groundwater monitoring has been performed at the Site. Additional Information concerning Site soil and groundwater investigations are presented in the CAP (GeoEngineers, 2003).

2.2. Nature and Extent of Contamination

2.2.1. Soil

Soil present at the Site contains metals including cadmium, nickel, and chromium at concentrations greater than the Model Toxics Control Act (MTCA) Method B cleanup levels (Chapter 173-340 WAC). Lead is present in soil at the Site at concentrations greater than the MTCA Method A cleanup level. Additionally, soil has been identified to contain metals at concentrations greater than the Toxicity Characteristic criteria (WAC 173-303-090) in two areas. Soil with metals concentrations greater than cleanup levels are generally present across the Site from the surface to depths up to 9 feet below ground surface (bgs). Finally, vinyl chloride is present in soil in the northeast portion of the Site at concentrations greater than the Method B cleanup level at depths up to 6.5 feet bgs (GeoEngineers, 2003).

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2.2.2. Groundwater

Semi-annual groundwater monitoring has been performed at the Site in monitoring wells MW-2, MW-3, MW-4 and MW-5 (Figure 2) starting in 2004. Metals including cadmium, chromium, hexavalent chromium, copper, and nickel as well as cyanide have been detected in groundwater at the Site during monitoring performed in 2004 through 2009. In groundwater samples collected between 2004 and 2009, hexavalent chromium, copper, nickel, and cyanide were detected in one or more samples at concentrations greater than the Site cleanup levels. During groundwater monitoring performed in 2010, cyanide was detected once at a concentration greater than the cleanup level. Cadmium, chromium, hexavalent chromium, copper, nickel, as well as cyanide were not detected at concentrations greater than the cleanup levels in any other groundwater samples collected from the Site in 2010 (Ecology, 2011).

3.0 COMPLIANCE MONITORING

Compliance monitoring will be implemented during the Site remedial action in accordance with the CAP (GeoEngineers, 2003) and WAC 173-340-410. The three types of compliance monitoring to be conducted include protection monitoring, performance monitoring, and confirmational monitoring. The objectives of compliance monitoring are to protect human health and the environment during the remedial action (protection monitoring), verify that cleanup standards have been achieved and, if appropriate, that other performance standards have been achieved such as monitoring necessary to demonstrate compliance with a permit or substantive requirements of other programs (performance monitoring), and confirm the long-term effectiveness of the remedial action (confirmational monitoring). Compliance monitoring activities are described in the following sections.

3.1. Protection Monitoring

Protection monitoring will include monitoring of worker health and safety and environmental protection practices such as stormwater, erosion, and sediment controls. The purpose of protection monitoring is to confirm that human health and the environment are adequately protected during the remedial action.

3.1.1. Worker Health and Safety

Remediation-related construction activities will be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (WISHA) (RCW 49.17) and the Federal Occupational Safety and Health Act (OSHA) (29 CFR 1910, 1926). These regulations include requirements that workers are to be protected from exposure to contaminants. A site-specific Health and Safety Plan (HASP) applicable to GeoEngineers' work is included as Appendix A. The FWDA's selected construction contractor will be required to prepare and submit a separate HASP for use by the contractor's personnel. Personnel engaged in work that involves hazardous material excavation and handling shall comply with the provisions of WAC 173-340-810 (MTCA Cleanup Regulation, Worker Safety and Health) and be HAZWOPER, OSHA and/or WISHA certified.

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3.1.2. Environmental Protection

Environmental protection measures consisting of best management practices (BMPs) for stormwater, sediment, drainage, and erosion control; spill prevention and pollution control; and all other controls needed to protect environmental quality during remedial actions will be implemented. Environmental protection measures including a Spill Prevention, Control and Countermeasure (SPCC) Plan will be prepared and provided by the selected contractor in the contractor's submittal package. The Contractor will be required to conform with all permits for the project and implement the Ecology-approved Stormwater Pollution Prevention Plan (SWPPP) including the installation, inspection and maintenance necessary for stormwater management, temporary erosion and sediment control measures, and SPCC measures, as necessary, for the duration of the project. The minimum standards for environmental protection measures that will be implemented are described in the EDR (GeoEngineers, 2011a) and the project-specific SWPPP. If the FWDA or any governmental agency determines that the contractor's environmental protection measures are inadequate to meet the intent of applicable regulations, the contractor will be required to implement additional stormwater runoff, erosion control, and/or SPCC measures to address the deficiencies.

3.2. Performance Monitoring

Performance monitoring will be conducted to verify that the remedial action attains the cleanup levels established for the Site as well as other performance standards including characterization and monitoring necessary to demonstrate compliance with permit, disposal, and discharge requirements. Performance monitoring to be performed as part of the remedial action includes the following:

- Backfill and capping material characterization;
- Limits of soil excavation verification;
- Soil stockpile characterization for disposal; and
- Water characterization prior to discharge.

The following sections further describe performance monitoring to be performed at the Site as part of the remedial action.

3.2.1. Backfill and Capping Material Characterization

The contractor selected to perform remedial activities will identify the source or sources (i.e., borrow pits, supplier facilities, etc.) that are proposed to provide backfill and capping materials and shall also provide the results of grain-size distribution (ASTM International [ASTM] D 422) and modified Proctor (ASTM D 1557) tests performed on all proposed types of backfill and capping material from the identified sources. GeoEngineers personnel shall perform an inspection of the proposed backfill and capping material sources and collect samples to chemically characterize the backfill and capping material. Chemical analyses will be performed on the material to evaluate whether the material meets the MTCA Method B soil cleanup levels for unrestricted land use (ULU). The MTCA Method B soil cleanup levels for ULU are the Site cleanup levels specified in the CAP to protect human health via direct contact. Chemical analysis of the backfill and capping material and comparison of the analytical results to the MTCA Method B ULU criteria

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shall be performed prior to the contractor importing the material to the Site. If the results from a specific backfill or capping material sample indicate the presence of one or more chemicals at concentrations greater than the MTCA Method B cleanup levels, the material will not be imported and used at the American Plating Site.

3.2.2. Limits of Soil Excavation Verification

Excavation will be performed in two areas (Figure 2) at the Site to remove soil that was identified to contain metals at concentrations greater than the Toxicity Characteristic criteria (WAC 173-303-090). The results of Toxicity Characteristic Leaching Procedure (TCLP) analyses on soil samples from borings performed at the Site identified the presence of chromium and/or cadmium at concentrations greater than the criteria. Soil sampling and analysis will be performed at the limits of the soil excavations to verify removal of soil with concentrations of chromium and cadmium greater than Toxicity Characteristic criteria.

The initial limits of excavation at each area have been identified based on the results of previous investigation. Excavation will initially be performed to the limits identified in Figure 2. Field screening (i.e., visual observations) will be performed to evaluate whether additional excavation is needed to remove soil with metals concentrations greater than the Toxicity Characteristic criteria. When the initial limits of excavation have been reached, samples will be collected from the sidewalls and base (i.e., bottom) of each excavation.

Where the verification sample results are less than the Toxicity Characteristic criteria, no further excavation will be performed. Where the verification sample results are greater than the criteria, additional excavation will be performed to remove soil with concentrations of cadmium or chromium greater than the criteria. Following any additional excavation, additional verification samples will be collected and analyzed to verify that the remaining soil meets the criteria. Ecology shall be notified of any additional actions (i.e., additional excavation and sampling) to be performed in response to the verification sample results.

3.2.3. Soil Stockpile Characterization for Disposal

The soil excavated from the two areas will be stockpiled for characterization prior to disposal. The stockpile area will be bermed and lined with plastic which will be secured beneath the stockpile area as well as covered with plastic. Samples of stockpiled soil removed from the two soil excavation areas will be collected and analyzed to characterize the stockpiled soil for disposal. The number of samples to be collected and analyses to be performed will be based on the landfill requirements and disposal criteria. The results from stockpiled soil sampling and analysis will be compared to landfill disposal criteria to identify the appropriate disposal location. Sampling and analysis, comparison of the sample results to landfill criteria, and acceptance of the stockpiled material by the landfill will be performed/obtained prior to transport of the stockpiled soil to a landfill for disposal.

3.2.4. Water Characterization Prior to Discharge

It is anticipated that storm water that comes in contact with contaminated soil that is contained as part of the remedial action and any water resulting from dewatering of excavations on the Site will be discharged to the City of Tacoma sanitary sewer. Samples of the storm water and dewatering

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water would be collected and analyzed to characterize the water for discharge to the City of Tacoma sanitary sewer. The results of water sampling and analysis would be compared to the City of Tacoma Special Approved Discharge (SAD) to the sanitary sewer criteria. Sampling, and analysis, comparison of the sample results to the SAD criteria, and City of Tacoma approval for discharge would be performed/obtained prior to discharge to the sanitary sewer.

3.3. Confirmational (Post-Construction) Monitoring

Following the completion of the remedial action, confirmational groundwater monitoring will be performed at the Site to evaluate the long-term effectiveness of the remedial action. Groundwater samples will be collected on a semi-annual basis from wells installed at the conditional point of compliance located adjacent to the Thea Foss Waterway. The results of groundwater analyses will be evaluated based on the cleanup criteria specified in the CAP to evaluate compliance with the cleanup levels.

Monitoring wells currently present at the Site will be decommissioned as part of the remedial action to facilitate remediation activities. New, replacement monitoring wells will be installed at the approximate locations of existing monitoring wells MW-3, MW-4 and MW-5. The new wells will be installed to monitor shallow groundwater quality conditions. The proposed location of the replacement wells are shown on Figure 2.

If the monitored analytes are detected at concentrations exceeding the Site cleanup levels, additional confirmational groundwater monitoring may be performed. If additional confirmational groundwater monitoring is necessary, sampling frequency and groundwater monitoring requirements will be identified based on discussions with Ecology.

3.4. Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) requirements and procedures that will be implemented during compliance monitoring activities are presented in the Sampling and Analysis Plan (SAP) (Appendix B) and Quality Assurance Project Plan (QAPP) (Appendix C). The purpose of these documents is to describe soil and water sampling, analysis, and quality control procedures that will be implemented to produce chemical and field data that are representative, valid and accurate for use in evaluating the remedial action effectiveness.

4.0 SCHEDULE

Pending permit approvals, remediation-related construction work is scheduled to begin within 30 days of Ecology approval of the Final EDR. Remediation-related construction work is anticipated to occur over a period of 30 to 60 days beginning in January 2012.

5.0 REPORTING

Following completion of remedial action construction activities, a Remedial Action Construction Report (RACR) summarizing cleanup activities and results of confirmational monitoring will be prepared in accordance with WAC 173-340-400. The RACR will also include documentation of

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waste material disposal (i.e., waste manifests and disposal receipts) and as-built drawings. A draft of the RACR will be submitted to Ecology for review prior to preparation of the final RACR.

A report summarizing the results of confirmational groundwater monitoring will be prepared upon completion of each semi-annual groundwater monitoring event.

Compliance monitoring data will be provided to Ecology in the electronic format required by Ecology's Environmental Information Management Policy 840.

6.0 LIMITATIONS

We have prepared this Compliance Monitoring Plan for use by Ecology and the FWDA during the remedial action at the American Plating Site. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

7.0 REFERENCES

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AGI 1989. Phase II Soil and Ground Water Investigation, American Plating, Inc., Tacoma, Washington. May 1989.

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GeoEngineers, Inc., "Draft Final Cleanup Action Plan, Former American Plating, Inc., 2110 East D Street, Tacoma, Washington" GEI File No. 10751-002-00, dated November 24, 2003.

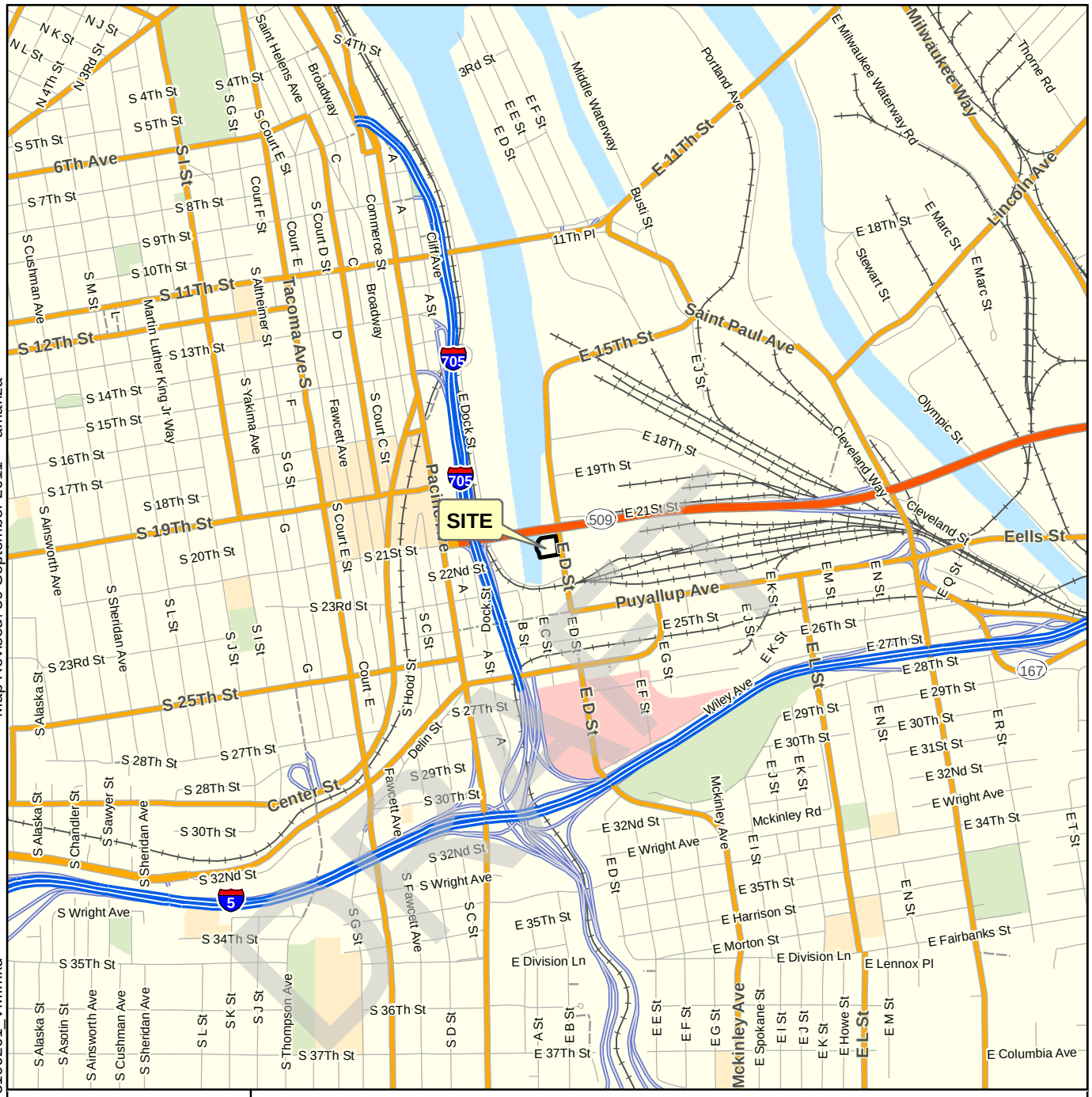
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PRC 1995. Final Report for Resource Conservation and Recovery Act Comprehensive Groundwater Monitoring Evaluation, American Plating Company, Inc. (Lewis R. Jones), Tacoma, Washington. January 5, 1995.

SAIC 2003. Interim Action Plan, American Plating Site, Tacoma, Washington. April 25, 2003.

Washington State Department of Ecology 2011, Post-Interim-Action Groundwater Monitoring Results, April and October 2010, February 2011, Publication No. 11-03-016.

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Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

Compliance Monitoring Plan
American Plating Site Remediation Project
Tacoma, Washington

GeoEngineers

Figure 1

Office: TAC Path: \\tac\Projects\10\10751002\GIS\10751002_VM.mxd Map Revised: 30 September 2011 amanza



Data Source: Aerial image from Aerials Express Seattle, 2009.
Sample locations provided by Marv Coleman,
Ecology Personal Communication, November 2003.

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

- Existing Monitoring Well Number and Approximate Location To be Decommissioned During Remedial Action
- New Monitoring Well Number and Approximate Location To be Installed After Remedial Action
- Planned Soil Excavation Areas
- Property Boundary
- Ordinary High Water Mark

N W E S

0 50
Feet

Site Plan

Compliance Monitoring Plan
American Plating Site Remediation Project
Tacoma, Washington

GeoEngineers

Figure 2

Map Revised: 30 September 2011 amanza
Path: \\tac\Projects\10\10751002\GIS\10751002O1_SitePlan.mxd
Office: SEA

APPENDIX A
Health and Safety Plan

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Draft Health and Safety Plan (HASP)

American Plating Site Remediation Project
2110 East D Street
Tacoma, Washington

for
Washington State Department of Ecology

on Behalf of Foss Waterway Development Authority

October 4, 2011

GeoEngineers

1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

30 YEARS 2010

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SITE HEALTH AND SAFETY PLAN
American Plating Site Remediation Project
Tacoma, Washington

This HASP is to be used in conjunction with the GeoEngineers Safety Program Manual. Together, the written safety programs and this HASP constitute the Site safety plan for this Site. This plan is to be used by GeoEngineers personnel on this Site and must be available on-site. If the work entails potential exposures to other substances or unusual situations, additional safety and health information will be included, and the plan will need to be approved by the GeoEngineers Health and Safety Manager. All plans are to be used in conjunction with current standards and policies outlined in the GeoEngineers Health and Safety Program Manual.

Liability Clause: If requested by subcontractors, this Site safety plan may be provided for informational purposes only. In this case, Form C-3 shall be signed by the subcontractor. Please be advised that this Site Safety Plan is intended for use by GeoEngineers Employees only. Nothing herein shall be construed as granting rights to GeoEngineers' subcontractors or any other contractors working on this Site to use or legally rely on this Site Safety Plan. GeoEngineers specifically disclaims any responsibility for the health and safety of any person not employed by them.

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1.0 GENERAL PROJECT INFORMATION

Project Name:	American Plating Site
Project Number:	10751-002-01
Type of Project:	Construction monitoring, soil and water sampling and restoration monitoring.
Start/Completion:	Remediation-related construction work is scheduled to begin within 30 days of Ecology approval of the Final Engineering Design Report and estimated to occur over a period of 1 to 2 months beginning in January 2012.
Subcontractors:	TBD

2.0 WORK PLAN

GeoEngineers will oversee a remedial action for the Foss Waterway Development Authority's (FWDA's) American Plating Site (Site). The purpose of this remedial action is to address contamination resulting from releases of metals from past metal plating operations at the Site. As part of the remedial action, the GeoEngineers' scope includes:

- Assisting the remediation contractor in identifying and removing contaminated soil from the Site for permitted off site disposal.
- Obtaining soil samples from the limits of excavation, obtaining soil samples from soil stockpiles, obtaining soil samples from backfill and capping material and submitting the samples to a laboratory for chemical analysis.
- Obtaining water samples during remedial excavation activities, as necessary, and submitting the samples to a laboratory for chemical analysis.
- Site capping and restoration monitoring following completion of remedial excavation activities.

2.1. Site Description

The Site is located at 2110 East D Street in Tacoma, Washington. The Site is currently owned by the FWDA and is being leased to Berg Scaffolding which operates a scaffolding rental business and stores equipment at the Site. The FWDA plans to ultimately redevelop the Site into a City of Tacoma (City) public park consistent with the Thea Foss Waterway Design and Development Plan and Tacoma's Comprehensive Land Use Management Plan developed in compliance with the Washington State Growth Management Act.

2.2. Site History

The property has primarily been used for industrial activities. Puget Sound Plating and Seymour Electroplating occupied the Site between 1955 and 1976. Lewis R. Jones owned the property between 1962 and 2003. American Plating, Inc. occupied the Site from 1976 to 1986. All three of these firms performed metal plating, including brass, cadmium, chromium, copper, nickel and zinc plating. American Plating ceased operations in January 1986.

2.3. List of Field Activities

Check the activities to be completed during the project

X	Site reconnaissance	X	Field Screening of Soil Samples
	Exploratory Borings		Vapor Measurements
X	Construction Monitoring	X	Groundwater Sampling
	Surveying		Groundwater Depth and Free Product Measurement
	Test Pit Exploration		Product Sample Collection
X	Monitoring Well Installation	X	Soil Stockpile Testing
X	Monitoring Well Development	X	Remedial Excavation
X	Soil Sample Collection	X	Paving
	Remediation System Monitoring		Landscaping/Wetland Restoration

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3.0 LIST OF FIELD PERSONNEL AND TRAINING

Employee on Site	Date of HAZWOPER Training (24-/40-hr)	Date of 8-Hour Refresher Training	First Aid/CPR	Date of Respirator Fit Test
Iain Wingard	1/20/92	1/26/11	8/4/09	
Nick Rohrbach	6/2/02	1/26/11	6/10/10	10/20/09
Aaron Waggoner	8/11/00	12/9/10	12/7/10	7/30/10
John Deeds	6/30/97	1/26/11	4/7/09	2/14/11
Garrett Leque	12/24/02	12/18/10	11/11/08	2/3/10

4.0 CHAIN OF COMMAND

Chain Of Command	Title	Name	Telephone Numbers
1	Project Manager	Iain Wingard	(c) 206.595.7402
2	HAZWOPER Supervisor	Nick Rohrbach	(c) 253.732.2138
3	Field Engineer/Geologist	Aaron Waggoner John Deeds Garrett Leque Nick Rohrbach	(c) 253.579.2176 (c) 253.312.8626 (c) 253.312.7958 (c) 253.732.2138
4	Site Safety and Health Supervisor*	Nick Rohrbach	(c) 253.732.2138
5	Client Assigned Site Supervisor	TBD	TBD
6	Health and Safety Program Manager	Wayne Adams	(o) 253.383.4940 (c) 253.350.4387
NA	Subcontractor(s)	TBD	TBD
	Current Owner	FWDA representative Su Dowie	(o) 253.597.8122

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* **Site Safety and Health Supervisor** -- The individual present at a hazardous waste site responsible to the employer and who has the authority and knowledge necessary to establish the Site-specific health and safety plan and verify compliance with applicable safety and health requirements.

5.0 EMERGENCY INFORMATION

Hospital Name and Address: St. Joseph's Hospital
1717 South J Street
Tacoma, WA 98405

Phone Numbers (Hospital ER): Phone: 253.426-4101

1. Start on E D ST (at E 21ST ST & E D ST in TACOI going toward E DOCK ST
2. Turn R on PUYALLUP AVE
3. Continue on S 24TH ST
4. Turn R on PACIFIC AVE(WA-509 N)
5. Turn L on S 21ST ST
6. Turn R on TACOMA AVE S
7. Turn L on S 19TH ST
8. Turn R on S J ST
9. Arrive at 1717 S J ST, TACOMA, on the R



6.0 STANDARD EMERGENCY PROCEDURES

- **Get help**
  - Send another worker to phone 9-1-1 (if necessary)
  - As soon as feasible, notify GeoEngineers' Project Manager
- **Reduce risk to injured person**
  - Turn off equipment
  - Move person from injury location (only if in life-threatening situation)
  - Keep person warm
  - Perform CPR (if necessary)
- **Transport injured person to medical treatment facility (if necessary)**
  - By ambulance (if necessary) or GeoEngineers' vehicle
  - Stay with person at medical facility
  - Keep GeoEngineers' project manager apprised of situation and notify Human Resources Manager of situation

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7.0 HAZARD ANALYSIS

A hazard assessment will be completed at every Site prior to beginning field activities. Updates will be included in the daily log. This list is a summary of hazards listed on the form.

7.1. Physical Hazards

X	Drill rigs
X	Backhoe
X	Trackhoe
	Crane
X	Front End Loader
X	Excavations/trenching (1:1 slopes for Type B soil)
X	Shored/braced excavation if greater than 4 feet of depth
X	Overhead hazards/power lines
X	Tripping/puncture hazards (debris on-site, steep slopes or pits)
X	Unusual traffic hazard – Truck and Trailer traffic
X	Heat/Cold, Humidity
X	Utilities/utility locate

- Work areas will be marked with reflective cones, barricades and/or caution tape. High-visibility vests will be worn by on-site personnel to ensure they can be seen by vehicle and equipment operators.
- Field personnel will be aware at all times of the location and motion of heavy equipment in the area of work to ensure a safe distance between personnel and the equipment. Personnel will be visible to the operator at all times and will remain out of the swing and/or direction of the equipment apparatus. Personnel will approach operating heavy equipment only when they are certain the operator has indicated that it is safe to do so through hand signal or other acceptable means.
- Heavy equipment and/or vehicles used on this Site will not work within 20 feet of overhead utility lines without first ensuring that the lines are not energized. This distance may be reduced to 10 feet depending on the client and the use of a safety watch.
- Personnel entry into unshored or unsloped excavations deeper than 4 feet is not allowed. Any trenching and shoring requirements will follow guidelines established in WAC 296-155, the Washington State Construction Standards or OSHA 1926.651 Excavation Requirements. In the event that a worker is required to enter an excavation deeper than 4 feet, a trench box or other acceptable shoring will be employed or the side walls of the excavation will be sloped according to the soil type and guidelines as outlined in DOSH/OSHA regulations. If the shoring/sloping deviates from that outlined in the WAC, it will be designed and stamped by a PE. Prior to entry, personnel will conduct air monitoring as described later in this plan. All hazardous encumbrances and excavated material will be stockpiled at least 2 feet from the edge of a trench or open pit. If concentrations of volatile gases accumulate within an open trench or excavation, the means of entering shall adhere to confined space entry and air monitoring procedures outlined under the air monitoring recommendations in this Plan and/or the GeoEngineers Health and Safety Program.

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- Personnel will avoid tripping hazards, steep slopes, pits and other hazardous encumbrances. If it becomes necessary to work within 6 feet of the edge of a pit, slope or other potentially hazardous area, appropriate fall protection measures will be implemented by the Site Safety and Health Supervisor in accordance with OSHA/DOSH regulations and the GeoEngineers Health and Safety Program.
- Cold stress control measures will be implemented according to the GeoEngineers Health and Safety Program to prevent frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature). Heated break areas and warm beverages shall be available during periods of cold weather.
- Heat stress control measures required for this Site will be implemented according to GeoEngineers Health and Safety Program with water provided on-site.
- Excessive levels of noise (exceeding 85 dBA) are anticipated during drilling. Personnel potentially exposed will wear ear plugs or muffs with a noise reduction rating (NRR) of at least 25 dB whenever it becomes difficult to carry on a conversation 3 feet away from a co-worker or whenever noise levels become bothersome. (Increasing the distance from the source will decrease the noise level noticeably.

7.2. Engineering Controls

X Trench shoring (1:1 slope for Type B Soils)
X Location work spaces upwind/wind direction monitoring
X Other soil covers (as needed)
X Other (specify): Dust control

7.3. Chemical Hazards

CHEMICAL HAZARDS (POTENTIALLY PRESENT AT SITE)

Substance	Pathways
Metals (chromium, cadmium, copper, lead, nickel) lead)	Soil/Water
Cyanide	Soil/Water
Vinyl chloride	Soil

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SPECIFIC CHEMICAL HAZARDS AND EXPOSURES (POTENTIALLY PRESENT AT SITE)

Summary of Potential Metals and Chemical Hazards				
Compound/ Description	**OSHA PEL Exposure Limits/IDLH**	**NIOSH/ACGIH TLV Exposure Limits/IDLH**	**Exposure Routes**	**Toxic Characteristics**
Chromium	OSHA = TWA 1 mg/m^3	NIOSH = TWA 0.5 mg/m^3 IDLH 250 mg/m^3 TLV-TWA = 0.5 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Chromium III is an essential nutrient, Chromium VI can cause irritation to nose, skin ulcers, linked to cancer.
Cadmium as dust	OSHA = TWA 0.005 mg/m^3 IDLH 9 mg/m^3	TLV –TWA = 0.002 mg/m^3	respiratory system, kidneys, prostate, blood	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]
Copper (dusts and mists)	OSHA = TWA 1 mg/m^3	NIOSH = TWA 1 mg/m^3 IDLH = 100 mg/m^3 TLV-TWA= 1 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Irritated eyes and respiratory system, coughing, difficulty breathing, wheezing, potential carcinogen
Lead (and inorganic compounds as lead)	OSHA = TWA 0.05 mg/m^3	NIOSH = TWA 0.05 mg/m^3 IDLH 100 mg/m^3 TLV –TWA = 0.05 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia, facial pallor, anorexia, weight loss, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, tremor, wrist and ankle paralysis, encephalopathy, kidney disease, irritated eyes, hypotension
Nickel, as Ni	OSHA = TWA 1 mg/m^3	NIOSH = TWA 0.015 mg/m^3 IDLH 10 mg/m^3 TLV –TWA = 0.1 mg/m^3	Inhalation inhalation, ingestion, skin and/or eye contact	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]
Potassium cyanide (as CN)	OSHA = * TWA 5 mg/m^3 *: TWA 5 mg/m^3 [*Note: The PEL also applies to other cyanides (as CN) except Hydrogen cyanide.]	NIOSH = * C 5 mg/m^3 (4.7 ppm) [10-minute] [*Note: The REL also applies to other cyanides (as CN) except Hydrogen cyanide.] IDLH 25 mg/m^3	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, upper respiratory system; asphyxia; lassitude (weakness, exhaustion), headache, confusion; nausea, vomiting; increased resp. rate, slow gasping respiration; thyroid, blood changes

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Summary of Potential Metals and Chemical Hazards				
Compound/ Description	**OSHA PEL Exposure Limits/IDLH**	**NIOSH/ACGIH TLV Exposure Limits/IDLH**	**Exposure Routes**	**Toxic Characteristics**
Vinyl Chloride Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations	OSHA = TWA 1 ppm, C 5 ppm	TLV TWA = 1 ppm,	inhalation, skin, and/or eye contact (liquid)	Lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]

Notes:

ppm	parts per million
mg/m^3	milligrams per cubic meter
OSHA	Occupational Safety and Health Administration
ACGIH	American Conference of Governmental Industrial Hygienists
NIOSH	National Institute for Occupational Safety and Health Recommended
OSHA = TWA	Time weighted average for no more than 8 hours (OSHA)
TLV-TWA	Threshold limit value- time weighted average for no more than 8 hours (ACGIH)
NIOSH = TWA	TWA of no more than 10 hours (NIOSH)
STEL	Short term exposure limit for no more than 15 min. (OSHA, ACGIH, NIOSH)
IDLH	Immediately dangerous to life or health if exposed for more than 30 min.(NIOSH)

Water Sampling: Splash hazard associated with groundwater extraction and sample collection. Possible corrosion hazard associated with sample preservatives. Wear protective clothing and eye protection and chemical-resistant gloves are required when handling samples.

Sample handling, packaging, and processing: Skin contact with contaminated media and preservative acids. Wear modified Level D PPE.

Decontamination of equipment: Inhalation or eye contact or skin contact with airborne mists or vapors, or contaminated liquids. Wear safety glasses; decontaminate clothing and skin prior to eating, drinking or other hand to mouth contact.

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8.0 BIOLOGICAL HAZARDS AND PROCEDURES

Y/N	Hazard	Procedures
Y	Poison Ivy or other vegetation	Hard hat, gloves and long sleeve shirt
Y	Insects or snakes	Hard hat, gloves and long sleeve shirt
N	Used hypodermic needs or other infectious Hazards	Do not pick up or contact
	Others:	

8.1. Additional Hazards

Update in Daily Report. Include evaluation of:

- Physical Hazards (excavations and shoring, equipment, traffic, tripping, heat stress, cold stress and others)
- Chemical Hazards (odors, spills, free product, airborne particulates and others present)

- Biological Hazards (snakes, spiders, other animals, discarded needles, poison ivy, pollen, bees/wasps and others present)

9.0 AIR MONITORING PLAN

Work upwind if at all possible.

Check instrumentation to be used:

X Photoionization Detector (PID)

____ Other (i.e., detector tubes): _____

Check monitoring frequency/locations and type (specify: work space, borehole, breathing zone):

____ 15 minutes - Continuous during soil disturbance activities or handling samples

____ 15 minutes

____ 30 minutes

X Initial monitoring and then hourly (in breathing zone during excavations, drilling, sampling)

Additional personal air monitoring for specific chemical exposure:

Dust/Metals/Pesticides/Herbicides

If drilling or excavation activities generate visible dust, the Site Safety and Health Supervisor will be notified immediately to assess the need for air monitoring and lab analysis for inhalable and respirable particulates.

AIR MONITORING ACTION LEVELS

Contaminant	Activity	Monitoring Device	Frequency of Monitoring Breathing Zone	Action Level	Action
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation; every 60 minutes and in event of odors	Background to 5 ppm in breathing zone	Use Level D or Modified Level D PPE
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 60 minutes and in event of odors	5 to 25 ppm in breathing zone	Upgrade to Level C PPE

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Contaminant	Activity	Monitoring Device	Frequency of Monitoring Breathing Zone	Action Level	Action
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 60 minutes	> 25 ppm in breathing zone	Stop work and evacuate the area. Contact Health and Safety Manager for guidance.
Combustible Atmosphere	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 60 minutes	>10% LEL or >1,000 ppm	Depends on contaminant. The PEL is usually exceeded before the lower explosive limit (LEL).
Combustible Atmosphere	Environmental Remedial Actions	PID or 4-gas meter	Start of shift; prior to excavation entry; every 60 minutes	>10% LEL or >1,000 ppm	Stop work and evacuate the Site. Contact Health and Safety Manager for guidance.
Oxygen Deficient/ Enriched Atmosphere	Environmental Remedial Actions Confined Spaces	Oxygen meter or 4-gas meter	Start of shift; prior to excavation entry; every 60 minutes	<19.5>23.5%	Continue work if inside range. If outside range, evacuate area and contact Health and Safety Manager.

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10.0 SITE CONTROL PLAN

Site control elements are included in the Engineering Design Report (EDR). The site control plan has been developed to minimize employee exposure to hazardous substances and includes the following.

10.1. Traffic or Vehicle Access Control Plans

Traffic and vehicle access control plans are included in the EDR . Traffic will be controlled by the contractor with the help of road work signs and cones.

10.2. Site Work Zones

Site work zones (Construction staging areas, soil stockpile areas) are identified in the EDR . In general, hot zones/exclusion zones will be located around each excavation. Only persons with the appropriate training will enter this perimeter while work is being conducted there.

A contamination reduction zone will be established just outside the exclusion zone for the decontamination of sampling equipment. Care will be taken to prevent the spread of

contamination. Equipment and personnel decontamination are discussed in the following sections, and the following types of equipment will be available to perform these activities:

- Scrub brushes;
- Spray rinse applicator;
- Plastic garbage bags; and
- Container of Alconox/water solution and Alconox powder.

Method of delineation/excluding non-site personnel

X	Fence
	Survey Tape
X	Traffic Cones
	Other

10.3. Buddy System

Personnel on-site should use the buddy system (pairs), particularly whenever communication is restricted. If only one GeoEngineers employee is on-site, a buddy system can be arranged with subcontractor / contractor personnel.

10.4. Site Communication Plan

Positive communications (within sight and hearing distance or via radio) should be maintained between pairs on-site, with the pair remaining in proximity to assist each other in case of emergencies. The team should prearrange hand signals or other emergency signals for communication when voice communication becomes impaired (including cases of lack of radios or radio breakdown). In these instances, you should consider suspending work until communication can be restored; if not, the following are some examples for communication:

1. Hand gripping throat: Out of air, can't breathe.
2. Gripping partner's wrist or placing both hands around waist: Leave area immediately, no debate.
3. Hands on top of head: Need assistance.
4. Thumbs up: Okay, I'm all right: or I understand.
5. Thumbs down: No, negative.

10.5. Decontamination Procedures

Decontamination consists of washing soiled boots and gloves using bucket and brush provided on-site in the contamination reduction zone. If Level C protection is being implement, outer protective Tyvek clothing, inner gloves and respirator will then be removed, hands and face will be washed in either a portable wash station or a bathroom facility in the support zone. Employees will perform decontamination procedures and wash prior to eating, drinking or leaving the Site.

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Sampling equipment will be decontaminated using wet decontamination procedures:

- Wash and scrub equipment with Alconox/Liquinox and tap water solution
- Rinse with tap water
- Rinse with distilled water
- Repeat entire procedure or any parts of the procedure as necessary.

In addition to wet decontamination procedures, other measures will be taken to prevent cross contamination. These measures include changing out disposable gloves between each sampling location, using fresh paper towels at each sample location, and maintaining a clean work area. Downhole drilling equipment will be decontaminated using a hot-water, high-pressure washer. Decontamination water will be stored on-site in 55-gallon drums.

10.6. Waste Disposal or Storage

PPE disposal (specify): Used PPE to be placed in on-site trash receptacles pending disposal.

Drill cuttings/excavated soil storage and disposal:

_____ On-site, pending analysis and further action

_X_ Secured (list method) 55-Gallon Drums

_X_ Other (describe destination, responsible parties): Stockpiling, landfill disposal (see EDR)

11.0 PERSONAL PROTECTIVE EQUIPMENT

PPE will consist of standard Level D equipment.

Air monitoring will be conducted to determine the level of respiratory protection.

- Half-face combination organic vapor/high efficiency particulate air (HEPA) or P100 cartridge respirators will be available on-site to be used as necessary. P100 cartridges are to be used only if PID measurements are below the Site action limit. P100 cartridges are used for protection against dust, metals and asbestos, while the combination organic vapor/HEPA cartridges are protective against both dust and vapor. Ensure that the PID or TLV will detect the chemicals of concern on-site.
- Level D PPE unless a higher level of protection is required will be worn at all times on the Site. Potentially exposed personnel will wash gloves, hands, face and other pertinent items to prevent hand-to-mouth contact. This will be done prior to hand-to-mouth activities including eating, smoking, etc.
- Adequate personnel and equipment decontamination will be used to decrease potential ingestion and inhalation.

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Check applicable personal protection gear to be used:

X	Hardhat (if overhead hazards, or client requests)
X	Steel-toed boots (if crushing hazards are a potential or if client requests)
X	Safety glasses (if dust, particles, or other hazards are present or client requests)
X	Hearing protection (if it is difficult to carry on a conversation 3 feet away)
X	Rubber boots (if wet conditions)
	Life Jackets (for work near/over water)

Gloves (specify):

X	Nitrile
X	Latex
	Liners
X	Leather

Protective clothing:

	Tyvek (if dry conditions are encountered, Tyvek is sufficient)
	Saranex (personnel shall use Saranex if liquids are handled or splash may be an issue)
X	Cotton
X	Rain gear (as needed)
X	Layered warm clothing (as needed)

Inhalation hazard protection:

X	Level D
	Level C (respirators with organic vapor/HEPA or P100 filters)

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11.1. Personal Protective Equipment Inspections

PPE clothing ensembles designated for use during Site activities shall be selected to provide protection against known or anticipated hazards. However, no protective garment, glove, or boot is entirely chemical-resistant, nor does any PPE provide protection against all types of hazards. To obtain optimum performance from PPE, Site personnel shall be trained in the proper use and inspection of PPE. This training shall include the following:

- Inspect PPE before and during use for imperfect seams, non-uniform coatings, tears, poorly functioning closures or other defects. If the integrity of the PPE is compromised in any manner, proceed to the contamination reduction zone and replace the PPE.
- Inspect PPE during use for visible signs of chemical permeation such as swelling, discoloration, stiffness, brittleness, cracks, tears or other signs of punctures. If the integrity of the PPE is compromised in any manner, proceed to the contamination reduction zone and replace the PPE.
- Disposable PPE should not be reused after breaks unless it has been properly decontaminated.

11.2. Respirator Selection, Use and Maintenance

If respirators are required, Site personnel shall be trained before use on the proper use, maintenance and limitations of respirators. Additionally, they must be medically qualified to wear a respiratory protection in accordance with 29 CFR 1910.134. Site personnel who will use a tight-fitting respirator must have passed a qualitative or quantitative fit test conducted in accordance with an OSHA-accepted fit test protocol. Fit testing must be repeated annually or whenever a new type of respirator is used. Respirators will be stored in a protective container.

11.2.1. Respirator Cartridges

If Site personnel are required to wear air-purifying respirators, the appropriate cartridges shall be selected to protect personnel from known or anticipated Site contaminants. The respirator/cartridge combination shall be certified and approved by the National Institute for Occupational Safety and Health (NIOSH). A cartridge change-out schedule shall be developed based on known Site contaminants, anticipated contaminant concentrations and data supplied by the cartridge manufacturer related to the absorption capacity of the cartridge for specific contaminants. Site personnel shall be made aware of the cartridge change-out schedule prior to the initiation of Site activities. Site personnel shall also be instructed to change respirator cartridges if they detect increased resistance during inhalation or detect vapor breakthrough by smell, taste or feel, although breakthrough is not an acceptable method of determining the change-out schedule.

11.2.2. Respirator Inspection and Cleaning

The Site personnel shall inspect respirators prior to each use in accordance with the manufacturer's instructions. In addition, Site personnel wearing a tight-fitting respirator shall perform a positive and negative pressure user seal check each time the respirator is donned, to ensure proper fit and function. User seal checks shall be performed in accordance with the GeoEngineers respiratory protection program or the respirator manufacturer's instructions.

11.2.3. Facial Hair and Corrective Lenses

Site personnel with facial hair that interferes with the sealing surface of a respirator shall not be permitted to wear respiratory protection or work in areas where respiratory protection is required. Normal eyeglasses cannot be worn under full-face respirators because the temple bars interfere with the sealing surface of the respirator. Site personnel requiring corrective lenses will be provided with spectacle inserts designed for use with full-face respirators. Contact lenses should not be worn with respiratory protection.

12.0 ADDITIONAL ELEMENTS

12.1. Cold Stress Prevention

Working in cold environments presents many hazards to Site personnel and can result in frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature).

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The combination of wind and cold temperatures increases the degree of cold stress experienced by Site personnel. Site personnel shall be trained on the signs and symptoms of cold-related illnesses, how the human body adapts to cold environments, and how to prevent the onset of cold-related illnesses. Heated break areas and warm beverages shall be provided during periods of cold weather.

12.2. Heat Stress Prevention

Working in hot environments can present many hazards to site personnel that can result in heat related illness such as heat rash, heat cramps, heat exhaustion or heat stroke. To prevent these illnesses site safety officers shall provide plenty of liquids (other than soda pop or coffee) to jobsite employees. Ideally, plain water is the best option and shall be provided. As an alternative a commercial electrolyte replacement mix may also be used as well.

As a general guideline when in hot weather, 1 gallon of liquids shall be provided per worker per day. In the course of a day's work in the heat, a worker may produce as much as 2 to 3 gallons of sweat. Because so many heat disorders involve excessive dehydration of the body, it is essential that water intake during the workday be about equal to the amount of sweat produced. Therefore, a worker should drink 5 to 7 ounces of fluids every 15 to 20 minutes to replenish the necessary fluids in the body. Heat acclimatized workers lose much less salt in their sweat than do workers who are not adjusted to the heat.

Adequate shelter shall also be available to protect personnel from heat and direct sunlight in order to increase physical efficiency and decrease the likelihood of accidents. Field tarps or canopies can be used where other shaded rest areas are not available. Cooling fans and ventilation can help workers stay cool.

Site personnel shall use the following as a guide to the signs and symptoms of heat-related illnesses and the measures to prevent the onset of heat-related injuries.

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Heat-Related Illness: Symptoms and First Aid		
Heat-Related Illness	**Symptoms**	**First Aid**
Heat Fatigue	Weakness; impaired motor skills; reduced ability to concentrate.	Take a short break in a cooler area. Pushing yourself to work through the condition can lead to a more serious illness.
Heat Cramps	Painful muscle spasms caused by salt imbalances in the body because of sweating.	Drinking carbohydrate-electrolyte replacement liquids may not eliminate the pain, but helps during recovery. Prevent by drinking a small cup of water every 15-20 minutes – even if you aren't thirsty.
Heat Rash	Irritation, especially where skin is wet with sweat or clothing is tight. Can lead to infection.	Move to cooler area. Wash and change clothing.
Heat Collapse	A person suddenly faints. Happens when the brain doesn't get enough oxygen because the blood has pooled in the victim's arms or legs.	Remove the victim to a cooler area to lie down during recovery. Do not give liquids to an unconscious person.
Heat Exhaustion	Headache, nausea, dizziness, thirst and giddiness. Can lead to vomiting and/or fainting. Victim has pale, clammy (moist) skin.	Remove victim to a cool, shaded area. Give water if the victim is alert and not nauseated. Don't leave the person alone. Cool the victim with a spray mist or wet cloth. If the person does not feel better in a few minutes, call for emergency help.
Heat Stroke	Victim has dry, pale skin (no sweating) or hot, red skin (looks like a sunburn) and is confused. Victim may have seizures and pass out.	Call for emergency help! Remove the victim to lie down in a cool, shaded area. Don't leave the person alone. If the victim is alert and not nauseated, give water. Cool the person. Place ice packs under the arm pits and in groin area.

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12.3. Emergency Response

- Personnel on-site should use the "buddy system" (pairs).
- Visual contact should be maintained between "pairs" on-site, with the team remaining in proximity to assist each other in case of emergencies.
- If any member of the field crew experiences any adverse exposure symptoms while on-site, the entire field crew should immediately halt work and act according to the instructions provided by the Site Safety and Health Supervisor.
- Wind indicators visible to all on-site personnel should be provided by the Site Safety and Health Supervisor to indicate possible routes for upwind escape. Alternatively, the Site Safety and Health Supervisor may ask on-site personnel to observe the wind direction periodically during Site activities.

- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated should result in the evacuation of the field team, contact of the PM, and reevaluation of the hazard and the level of protection required.
- If an accident occurs, the Site Safety and Health Supervisor and the injured person are to complete, within 24 hours, an Accident Report for submittal to the PM, the Health and Safety Program Manager and Human Resources. The PM should ensure that follow-up action is taken to correct the situation that caused the accident or exposure.

12.4. Personnel Medical Surveillance

GeoEngineers employees are not in a medical surveillance program because they do not fall into the category of "Employees Covered" in OSHA 1910.120(f)(2), which states a medical surveillance program is required for the following employees:

1. All employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year;
2. All employees who wear a respirator for 30 days or more a year or as required by state and federal regulations;
3. All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation; and Members of HAZMAT teams.

12.5. Sampling, Managing and Handling Drums and Containers

Drums and containers used during the remediation shall meet the appropriate Department of Transportation (DOT), OSHA and U.S. Environmental Protection Agency (EPA) regulations for the waste that they contain. Site operations shall be organized to minimize the amount of drum or container movement. When practicable, drums and containers shall be inspected and their integrity shall be ensured before they are moved. Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled. Before drums or containers are moved, all employees involved in the transfer operation shall be warned of the potential hazards associated with the contents.

Drums or containers and suitable quantities of proper absorbent shall be kept available and used where spills, leaks or rupture may occur. Where major spills may occur, a spill containment program shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred. Fire extinguishing equipment shall be on hand and ready for use to control incipient fires.

12.5.1. Spill Containment Plans (Drum and Container Handling)

Drums will be fitted with secure lids to limit the potential for spills. A spill containment plan will be prepared by the selected contractor.

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12.6. Entry Procedures for Tanks or Vaults (Confined Spaces)

GeoEngineers employees shall not enter confined spaces to perform work unless they have been properly trained and with hands-on experience in the use of retrieval equipment. If a project requires confined space entry, include a copy of the confined space permit and include the training documentation in this HASP.

Trenches greater than 4 feet in depth with the potential for buildup of a hazardous atmosphere are considered confined spaces.

12.7. Sanitation

Washrooms/portable toilets will be provided by the selected contractor during work activities.

12.8. Lighting

Field work will be generally conducted during daylight hours; artificial lighting is not anticipated to be necessary.

12.9. Excavation, Trenching and Shoring

All employees working on project sites where there is an excavation greater than 4 feet in depth shall be trained in excavation safety and shall utilize safe procedures. OSHA designates a 5-foot depth for instituting excavation safety procedures; however GeoEngineers will use the more conservative depth of 4 feet as specified by states such as Washington, Oregon and California. This program is for the protection of employees while working in excavations; however, employees should not enter excavations if there is an alternative.

GeoEngineers employees often do not have stop work authority on projects controlled by other contractors. However, any GeoEngineers employee, regardless of job title, working in the field will be responsible for contacting the Project Manager if they observe practices on the job Site that are serious safety violations that are not under their control. They will document the unsafe practices and will contact the Site safety coordinator as identified by the client. If no one is on-site, the Project Manager, once notified, will contact the client. This action establishes GeoEngineers' commitment to Site health and safety on all job Sites as our duty of care to the public, contractors and clients.

GeoEngineers will also be providing inspections and corrections of any work that subcontractors perform around excavations.

13.0 DOCUMENTATION TO BE COMPLETED FOR HAZWOPER PROJECTS

The following forms are required for Hazardous Waste Operations and Emergency Response (HAZWOPER) projects:

- Field Log
- Health and safety pre-entry briefing acknowledgment (Form C-1)
- Health and Safety Plan acknowledgment by GeoEngineers employees (Form C-2)

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- Contractor's Health and Safety Plan Disclaimer (Form C-3)
- Conditional forms available at GeoEngineers office: Accident Report

The Field Log is to contain the following information:

- Updates on hazard assessments, field decisions, conversations with subcontractors, client or other parties, etc.;
- Air monitoring/calibration results, including: personnel, locations monitored, activity at the time of monitoring, etc.;
- Actions taken;
- Action level for upgrading PPE and rationale; and
- Meteorological conditions (temperature, wind direction, wind speed, humidity, rain, snow, etc.).

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14.0 APPROVALS

1. Plan Prepared	Signature	Date
2. Plan Approval	PM Signature	Date
3. Health & Safety Officer	Wayne Adams Health & Safety Program Manager	Date

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FORM C-1
HEALTH AND SAFETY PRE-ENTRY BRIEFING
American Plating Site
File No. 10751-002-01

Inform employees, contractors and subcontractors or their representatives about:

- The nature, level and degree of exposure to hazardous substances they're likely to encounter;
- All Site-related emergency response procedures; and
- Any identified potential fire, explosion, health, safety or other hazards.

Conduct briefings for employees, contractors and subcontractors, or their representatives as follows:

- A pre-entry briefing before any Site activity is started; and
- Additional briefings, as needed, to make sure that the Site-specific HASP is followed.

Make sure all employees working on the Site are informed of any risks identified and trained on how to protect themselves and other workers against the Site hazards and risks

Update all information to reflect current sight activities and hazards.

All personnel participating in this project must receive initial health and safety orientation. Thereafter, brief tailgate safety meetings will be held as deemed necessary by the Site Safety and Health Supervisor.

The orientation and the tailgate safety meetings shall include a discussion of emergency response, Site communications and Site hazards.

Company Employee

Date	Topics	Attendee	Name	Initials

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FORM C-2
SITE SAFETY PLAN – GEOENGINEERS' EMPLOYEE ACKNOWLEDGMENT
American Plating Site
File No. 10751-002-01

(All GeoEngineers' Site workers shall complete this form, which should remain attached to the Safety Plan and filed with other project documentation).

I hereby verify that a copy of the current Safety Plan has been provided by GeoEngineers, Inc., for my review and personal use. I have read the document completely and acknowledge an understanding of the safety procedures and protocol for my responsibilities on site. I agree to comply with all required, specified safety regulations and procedures.

Print Name	**Signature**	**Date**

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FORM C-3
SUBCONTRACTOR AND SITE VISITOR SITE SAFETY FORM
American Plating Site
File No. 10751-002-01

I verify that a copy of the current Site Safety Plan has been provided by GeoEngineers, Inc. to inform me of the hazardous substances on site and to provide safety procedures and protocols that will be used by GeoEngineers' staff at the Site. By signing below, I agree that the safety of my employees is the responsibility of the undersigned company.

Print Name	Signature	Firm	Date

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APPENDIX B
Sampling and Analysis Plan

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Draft Sampling and Analysis Plan (SAP)

American Plating Site Remediation Project
2110 East D Street
Tacoma, Washington
for
Washington State Department of Ecology

on Behalf of Foss Waterway Development Authority

October 4, 2011

GeoEngineers

1101 South Fawcett Avenue, Suite 200
Tacoma, Washington 98402
253.383.4940

30 YEARS 2010

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1.0 INTRODUCTION

This document presents the Sampling and Analysis Plan (SAP) for remedial activities at the Foss Waterway Development Authority's (FWDA's) American Plating Site (Site) located at 2110 East D Street in Tacoma, Washington (Figure 1). This SAP serves as the primary guide for standard operating procedures for soil and water sampling to be completed during the remedial action.

The remedial action is being conducted by the FWDA to satisfy requirements of a Perspective Purchaser Consent Decree issued by the Washington State Department of Ecology (Ecology) to address contamination resulting from releases of metals from past metal plating operations at the Site. The objectives of the remedial action are presented in the Engineering Design Report (EDR) prepared for the Site (GeoEngineers, 2011a). Quality assurance and quality control (QA/QC) requirements for sampling and analsysis to be performed at the Site are presented in the Quality Assurance Project Plan (QAPP) provided in Appendix C of the Compliance Monitoring Plan (CMP) GeoEngineers, 2011b). The site-specific Health and Safety Plan (HASP) to be used during field activities is presented in Appendix A of the CMP (GeoEngineers, 2011c).

2.0 BACKGROUND

2.1. Problem Definition

Historical metal plating operations at the Site have resulted in releases of metals, cyanide, and vinyl chloride to soil. Previous Toxicity Characteristic Leaching Procedure (TCLP) analyses for metals on soil samples from borings performed at the Site identified the presence of chromium and/or cadmium at concentrations greater than the Toxicity Characteristic criteria (WAC 173-303-090) in two areas. The concentrations of metals in soil present at the Site are also greater than the Site cleanup levels. Additionally, Site contaminants have been detected in groundwater at concentrations greater than the Site cleanup levels.

The future use of the Site is as a public park and for public access. Ecology has determined that remedial actions are warranted at the Site to reduce the potential threat to human health and the environment from future Site use. The remedial actions to be performed at the Site include removing soil with chromium and cadmium concentrations greater than the Toxicity Characteristic criteria (WAC 173-303-090), capping the site to prevent direct contact with contaminated soil, and groundwater monitoring to evaluate the long-term effectiveness of the remediation action.

2.2. Site Description

The American Plating Site occupies approximately 1.4 acres of land and is located along the eastern shoreline at the head of the Thea Foss Waterway (Figure 1). The Site is bounded on the east by East D Street, on the north by Foss Landing and State Route 509 freeway, on the south by Berge Scaffolding, and on the west by the Foss Waterway (Figure 2).

The Site is relatively flat with an elevation change of approximately three feet across the Site. The Site surface is comprised of fill material of varying thickness. The fill material is present on top of an unconsolidated silt deposit that is underlain by deposits of sand and gravel.

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Groundwater is present at the Site at depths ranging from 5 to 9 feet below ground surface (bgs). Groundwater flow is interpreted to be in a northwesterly direction towards, and into, the Thea Foss Waterway. Groundwater in the fill at the Site is influenced by marine water in the Thea Foss Waterway as the groundwater elevations fluctuate with tidal elevations and groundwater is saline (GeoEngineers, 2003).

2.3. Site History

The property has been primarily used for light industrial activities. Puget Sound Plating and Seymour Electroplating occupied the Site between 1955 and 1976. Lewis R. Jones owned the property from 1962 to 2003. During that time, American Plating occupied the Site from 1976 to 1986. All three firms performed metal plating operations.

Between 1986 and 2003 multiple investigations, Site stabilization, and interim actions were performed to investigate the nature and extent of contamination, perform corrective actions, and initiate remedial actions at the Site. In 2003, the FWDA entered into a Prospective Purchaser Consent Decree with Ecology to complete remedial actions at the Site. The procedures specified in this SAP are to be performed during remediation activates implemented as part of the Consent Decree.

2.4. Project Description and Schedule

Remedial activities consist of excavation and off-site disposal as well as capping of soil containing metals concentrations above Site cleanup levels. Additionally, groundwater monitoring will be performed after remedial activities are completed to verify compliance with the groundwater cleanup levels. The objective of the remedial action is to eliminate, reduce, or otherwise control to the extent feasible and practicable, unacceptable risks to human health and the environment posed by metals in soil and groundwater at the Site in accordance with MTCA (WAC 173-340) and other applicable regulatory requirements.

Soil and water samples will collected as part of remedial and compliance monitoring activities for the following purposes:

- Backfill and capping material characterization;
- Limits of soil excavation verification;
- Soil stockpile characterization for disposal;
- Water characterization prior to discharge; and
- Confirmational groundwater monitoring.

The soil and water samples collected to support remedial activities performed at the American Plating Site will be submitted to Analytical Resources Incorporated (ARI) Laboratory in Tukwila, Washington for chemical analysis. The chemical analyses to be performed will be in accordance with the project specific requirements specified in the CAP prepared for the site (GeoEngineers, 2003) as well as requirements established for soil disposal and water discharge. The following sections describe sample collection procedures and analyses to be performed as part of remedial and confirmational groundwater monitoring activities.

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Pending permit approvals, remediation-related construction work is scheduled to begin within 30 days of Ecology approval of the Final EDR. Remediation-related construction work is anticipated to occur over a period of 30 to 60 days beginning in January 2012.

3.0 SAMPLING PROCEDURES

The following sections describe the sampling procedures that will be used during remediation activities and confirmational groundwater monitoring to characterize soil and water at the Site. Project QA/QC requirements for sampling and analysis are presented in the QAPP provided in Appendix C of the CMP (GeoEngineers, 2011a).

3.1. Backfill and Capping Material Characterization

Samples of backfill and capping material will be collected and analyzed to verify that the material meets the Site cleanup levels. The Model Toxics Control Act (MTCA) Method B soil cleanup levels for unrestricted land use (ULU) are the Site cleanup levels specified in the CAP to protect human health via direct contact. The results from backfill and capping material sampling and analysis will be compared to the MTCA Method B soil cleanup levels to verify that the material meets the cleanup levels. Sampling, analysis, and comparison of the sample results to the cleanup levels to verify compliance with the cleanup levels will be performed prior to the contractor importing the backfill and capping material to the Site.

The contractor selected to perform remediation activities will identify the source or sources (i.e., borrow pits, supplier facilities, etc.) that are proposed to provide backfill and capping materials. Samples of the backfill and capping materials will be collected for chemical analysis from stockpiles located at the source's facility.

Each sample of a proposed backfill or capping material will be comprised of three aliquots of the material collected from three locations around a material stockpile. At each location approximately 6 inches of material present at the surface of the stockpile will be removed prior to collecting a sample aliquot. Then an aliquot of the material will be collected using a clean (i.e., decontaminated) stainless steel spoon/trowel or directly using a clean, gloved hand (i.e., hand covered by a new nitrile glove) and placed in a clean stainless steel bowl. Three equal sized aliquots will be placed in the bowl and homogenized to prepare a backfill or capping material sample. The samples will be placed in pre-cleaned, previously unused sample jars supplied by the laboratory. The backfill and capping material samples will be labeled and placed in a cooler on ice for transport to the laboratory. Sample handling will follow appropriate chain of custody procedures from sample collection through analysis.

The backfill and capping material samples will be analyzed for the following:

- Metals by EPA Method 6010/7470/7471;
- Total cyanide by EPA Method 4500;
- Volatile organic compounds (VOCs) by EPA Method 8260B;
- Semi-volatile organic compounds (SVOCs) by EPA Method 8270D;

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- Petroleum hydrocarbons by NWTPH-G and NWTPH-Dx;
- Pesticides by EPA Method 8081A; and
- Polychlorinated biphenyls (PCBs) by EPA Method 8082B.

If the results from a specific backfill or capping material sample indicate the presence of one or more chemicals at concentrations greater than the MTCA Method B cleanup levels, the material will not be imported and used at the American Plating Site.

3.2. Limits of Soil Excavation Verification

Samples will be collected from the sidewalls and base (i.e., bottom) of two remedial excavation areas to verify that soil with concentrations greater than the Toxicity Characteristic criteria has been removed. Previous Toxicity Characteristic Leaching Procedure (TCLP) analyses for metals on soil samples from borings performed at the Site identified the presence of chromium and/or cadmium at concentrations greater than the Toxicity Characteristic criteria (WAC 173-303-090) in two areas. The soil in the two areas is being excavated, stockpiled, and disposed of off site as part of the remedial action. Soil sampling and analysis will be performed at the limits of the soil excavations to verify removal of soil with concentrations of chromium and cadmium greater than Toxicity Characteristic criteria.

The initial limits of excavation at each area have been identified based on the results of previous investigations. Excavation will initially be performed to the limits identified in Figure 2. Field screening (i.e., visual observations) will be performed at the initial limits of the excavation to evaluate whether additional excavation is needed to remove soil with metals concentrations greater than Toxicity Characteristic criteria prior to sample collection. The soil will be observed for physical evidence of possible contamination including unusual color, staining and/or odor. Field screening results will be recorded on field forms and the results will be used as a general guideline to delineate areas of possible contamination. When the limits of excavation have been reached based on field screening, samples will be collected from the sidewalls and bottom of each excavation.

A sample will be collected from each 50 lineal feet along each sidewall and from each 2,500 square feet (sf) (i.e., equivalent to 50 by 50 foot area) of excavation bottom in each excavation area. Soil samples collected from excavations that are less than approximately 4 feet in depth will be collected by field personnel by directly entering the excavation if it is safe to do so and using a clean stainless steel spoon/trowel or directly using a clean, gloved hand and placed in a clean stainless steel bowl. If it is not safe to enter an excavation, or where the excavation is deeper than 4 feet below ground surface (bgs), samples will be collected from material removed from the sample area by the excavation equipment and presented in the excavator bucket. Samples collected from the excavation equipment will be from material that has not come in contact with the bucket. The samples will be collected using a clean stainless steel spoon/trowel or directly using a clean, gloved hand and placed in a clean stainless steel bowl and homogenized prior to sample collection. The soil excavation verification samples will be placed in pre-cleaned, previously unused sample jars supplied by the laboratory. The samples will be labeled and placed in a cooler on ice for transport to the laboratory. Sample handling will follow appropriate chain of custody procedures from sample collection through analysis.

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The soil excavation verification samples will be analyzed for the following:

- Total cadmium and chromium by EPA Method 6010; and
- TCLP cadmium and chromium by EPA Method 6010

To the extent practical, the samples will be analyzed on a short turnaround basis to allow timely decision-making regarding the need for further excavation. The results of TCLP cadmium and chromium analyses will be compared to the Toxicity Characteristic criteria (WAC 173-303-090). If the results for a specific sidewall or bottom sample are less than Toxicity Characteristic criteria no additional excavation will be performed. If the results for a specific sidewall or bottom sample are greater than Toxicity Characteristic criteria, additional excavation will be performed in the area represented by the sample and an additional sample or samples will be collected at the rates specified above (i.e., 50 lineal feet along each sidewall and from each of 2,500 sf). The additional sample results will be compared to the Toxicity Characteristic criteria to evaluate whether excavation is complete in the area represented by the sample or whether additional excavation and sampling is to be performed.

3.3. Soil Stockpile Characterization for Disposal

Samples of stockpiled soil removed from the two soil excavation areas will be collected and analyzed to characterize the stockpiled soil for disposal. The number of samples to be collected and analyses to be performed will be based on the landfill requirements and disposal criteria. The results from stockpiled soil sampling and analysis will be compared to landfill disposal criteria to identify the appropriate disposal location. Sampling and analysis, comparison of the sample results to landfill criteria, and acceptance of the stockpiled material by the landfill will be performed/obtained prior to transport of the stockpiled soil to a landfill for disposal.

The excavated soil will be stockpiled in a bermed and plastic-lined area and covered with plastic. Samples will be collected from the stockpile(s) at a frequency specified by the landfill. At each stockpile sample location approximately 6 inches of material present at the surface of the stockpile will be removed prior to collecting a sample. Then a sample of the stockpiled material will be collected using a clean, stainless steel spoon/trowel or directly using a clean, gloved hand and placed in a clean stainless steel bowl. The sample material will then be homogenized prior to sample collection. The samples will be placed in pre-cleaned, previously unused sample jars supplied by the laboratory. The samples will be labeled and placed in a cooler on ice for transport to the laboratory. Sample handling will follow appropriate chain of custody procedures from sample collection through analysis.

The stockpile samples are anticipated to be analyzed for a combination of the following:

- Total Resource Conversation and Recovery Act (RCRA) metals by EPA Method 6010;
- Petroleum hydrocarbons by NWTPH-G and NWTPH-Dx;
- Volatile organic compounds (VOCs) by 8260B; and
- Total cyanide by EPA Method 4500.

Follow-up TCLP analyses for specific metals by EPA Method 6010 will be performed if the total metals result for a specific metal or metals exceed the 20-times rule.

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The results of stockpile sample analyses will be used to identify the appropriate disposal location for the excavated soil.

3.4. Water Characterization Prior to Discharge

It is anticipated that storm water that comes in contact with contaminated soil that is contained as part of the remedial action and any water resulting from dewatering of excavations on the Site will be discharged to the City of Tacoma sanitary sewer. Samples of the storm water and dewatering water would be collected and analyzed to characterize the water for discharge to the City of Tacoma sanitary sewer. The results of water sampling and analysis would be compared to the City of Tacoma Special Approved Discharge (SAD) for criteria. Sampling, and analysis, comparison of the sample results to the SAD criteria, and City of Tacoma approval for discharge would be performed/obtained prior to discharge to the sanitary sewer.

Water that is anticipated to be discharged to the sanitary sewer would be captured and held in a baker tank or other containment structure. A sample of the water would be collected from a discharge port on the tank or from within the tank or containment structure. The samples will be placed in pre-cleaned, previously unused sample bottles supplied by the laboratory. The samples will be labeled and placed in a cooler on ice for transport to the laboratory. Sample handling will follow appropriate chain of custody procedures from sample collection through analysis.

The water samples will be analyzed for the following:

- Total cadmium, chromium, copper, lead, and nickel by EPA Method 6010;
- Hexavalent chromium by EPA Method 6010;
- Petroleum hydrocarbons (i.e., gasoline-, diesel-, and oil-range hydrocarbons) by NWTPH-G and NWTPH-Dx;
- Total cyanide by EPA Method 4500; and

The results of water sample analyses will be used to receive authorization for discharge to the City of Tacoma sanitary sewer.

3.5. Groundwater Compliance Monitoring

Following the completion of the remedial action, groundwater samples will be collected from the Site and analyzed to evaluate the long-term effectiveness of the remedial action. The groundwater samples will be collected from wells installed at the conditional point of compliance located adjacent to the Thea Foss Waterway. The results of groundwater analyses will be evaluated based on the cleanup criteria specified in the CAP to evaluate compliance with the cleanup levels.

Monitoring wells currently present at the Site will be decommissioned as part of the remedial action. New, replacement monitoring wells will be installed at the approximate locations of existing monitoring wells MW-3, MW-4 and MW-5. The new wells will be installed to monitor shallow groundwater quality conditions. The proposed location of the replacement wells are shown on Figure 2.

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3.5.1. Monitoring Well Construction

Drilling and construction of the replacement monitoring wells will be conducted by a Washington State licensed driller in accordance with the Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC). Installation of the monitoring wells will be observed by a licensed geologist who will prepare a detailed log of the materials and depths of the wells. Monitoring well borings will be drilled using a hollow-stem auger drill rig or similar equipment. The monitoring wells are to be installed to depths of approximately 15 feet bgs. Soil cuttings from borings completed for installation of the monitoring wells will be placed in labeled and sealed 55-gallon drums. The drums will be stored temporarily at a secure location on the Site pending off-site disposal at a permitted facility.

Wells will be constructed of 2-inch-diameter, flush-threaded, Schedule 40 polyvinyl chloride (PVC) casing with machine-slotted PVC screen (0.010-inch). The screened interval will be 5-feet in length, similar to the existing wells.

Following placement of the well screen and casing in the borehole, a filter pack will be installed around the well screen. The filter pack will extend from the bottom of the well to above the top of the well screen. The filter pack material will consist of commercially prepared 10-20 silica sand. However, an alternate sand size/gradation may be used to minimize the turbidity of water entering the wells.

A bentonite annular seal will be placed above the sand pack to a depth of approximately 1-foot bgs. Each well will be completed with a concrete surface seal, and a flush-mount monument. The monument will be cemented in place from the surface to a depth of about 1-foot bgs.

The location of the new, replacement wells will be recorded using a hand-held Trimble GeoXT or similar global positioning system (GPS) unit. The GPS data will be used to provide coordinates for the new wells. The GPS data will be referenced to the Washington State Plane North Coordinate System (NAD83).

3.5.2. Monitoring Well Development

Each monitoring well will be developed to stabilize the filter pack and formation materials surrounding the well screen and restore the hydraulic connection between the well screen and the surrounding soil. The well screen interval will be gently surged with a decontaminated bailer or surge block and the well will be purged of water. Development will continue until a minimum of five casing volumes of water have been removed and turbidity of the purge water is relatively low. The removal rate and volume of groundwater removed will be recorded during well development. Water that is removed from the well during well development activities will be stored on site in labeled 55-gallon drums, pending off-site disposal. Depths to water in the monitoring wells will be measured prior to and following development.

3.5.3. Water Level Measurements

Water level measurements will be obtained at each monitoring well prior to purging and sample collection. All water levels will be measured using an electronic water level indicator and will be recorded to the nearest 0.01 foot. Measurements will be taken from the top of the well casing.

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3.5.4. Groundwater Sampling and Analysis

Groundwater samples will be collected using low-flow/low-turbidity sampling techniques to minimize the suspension of sediment in the samples. The wells will be purged and groundwater samples will be obtained from the wells using a peristaltic or submersible pump and disposable polyethylene tubing. Groundwater will be purged from the wells at a rate of approximately 0.5 liters per minute or less. A Horiba U-22 (or similar) water quality measuring system with a flow-through cell will be used to monitor water quality parameters during purging including electrical conductivity, dissolved oxygen, pH, salinity, total dissolved solids, turbidity, oxidation-reduction potential, and temperature. Samples will be collected from the wells after the water quality parameters vary by less than 10 percent on three consecutive measurements. The stabilized field measurements will be documented in the field log. Following well purging, the flow-through cell will be disconnected and groundwater samples will be collected in pre-cleaned, previously unused sample bottles supplied by the laboratory. Samples collected for dissolved metals will be filtered using a 0.45 micron membrane filter. The samples will be labeled and placed in a cooler on ice for transport to the laboratory. Sample handling will follow appropriate chain of custody procedures from sample collection through analysis.

The groundwater samples will be analyzed for the following:

- Dissolved cadmium, chromium, copper, and nickel by EPA Method 6010;
- Dissolved hexavalent chromium by EPA Method 6010; and
- Weak Acid Dissociable (WAD) cyanide by EPA Method 4500.

The results of groundwater analyses will be evaluated based on the cleanup criteria specified in the CAP to evaluate compliance with the cleanup levels.

3.6. Sample Handling

Sample handling procedures, including sample numbering, labeling, container and preservation requirements and holding times are described in QAPP provided in Appendix C of the CMP (GeoEngineers, 2011a).

3.7. Decontamination

Non-disposable sampling equipment will be decontaminated using the procedures presented in the QAPP provided in Appendix C of the CMP (GeoEngineers, 2011a).

4.0 DISPOSAL OF INVESTIGATION-DERIVED MATERIALS

4.1.1. Soil, Groundwater and Decontamination Water

Soil cuttings from borings completed to install new, replacement groundwater monitoring wells as well as development and purge water removed from the monitoring wells and decontamination water generated during sampling activities will be placed in labeled and sealed 55-gallon drums. The drums will be temporarily stored on site at a secure location pending off-site disposal at a permitted facility. Each drum will be labeled with the following information:

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- Material/media (i.e., soil) contained in the drum;
- Source of the material in the drum (i.e., locations and depths where appropriate);
- Date material was generated; and
- Name and telephone number of a contact person.

4.1.2. Disposition of Incidental Waste

Incidental waste generated during sampling activities includes items such as gloves, plastic sheeting, sample tubing, paper towels and similar expended and discarded field supplies. These materials are considered *de minimis* and will be disposed of in a local trash receptacle or county disposal facility.

5.0 QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC requirements and procedures that will be implemented during the remedial action are presented in the QAPP provided in Appendix C of the CMP (GeoEngineers, 2011a). The purpose of the QAPP is to collect environmental measurements to produce data that are scientifically valid, of known and acceptable quality and that meet established objectives.

6.0 REFERENCES

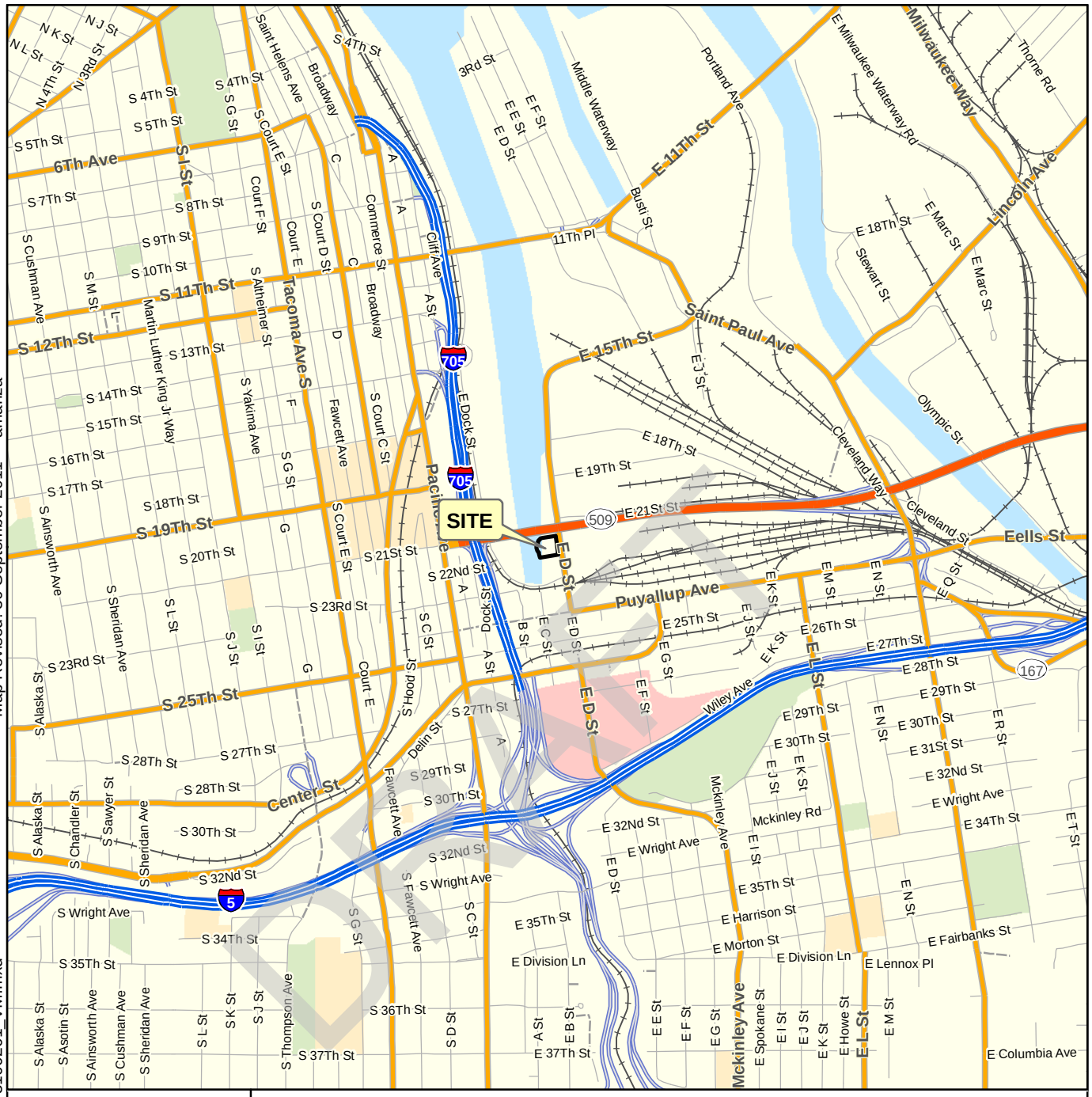
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Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
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Data Sources: ESRI Data & Maps

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

Sampling Analysis Plan
American Plating Site Remediation Project
Tacoma, Washington

GeoEngineers

Figure 1

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Data Source: Aerial image from Aerials Express Seattle, 2009.
Sample locations provided by Marv Coleman,
Ecology Personal Communication, November 2003.

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Notes:
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- Existing Monitoring Well Number and Approximate Location To be Decommissioned During Remedial Action
- New Monitoring Well Number and Approximate Location To be Installed After Remedial Action
- Planned Soil Excavation Areas
- Property Boundary
- Ordinary High Water Mark

N W E S

0 50
Feet

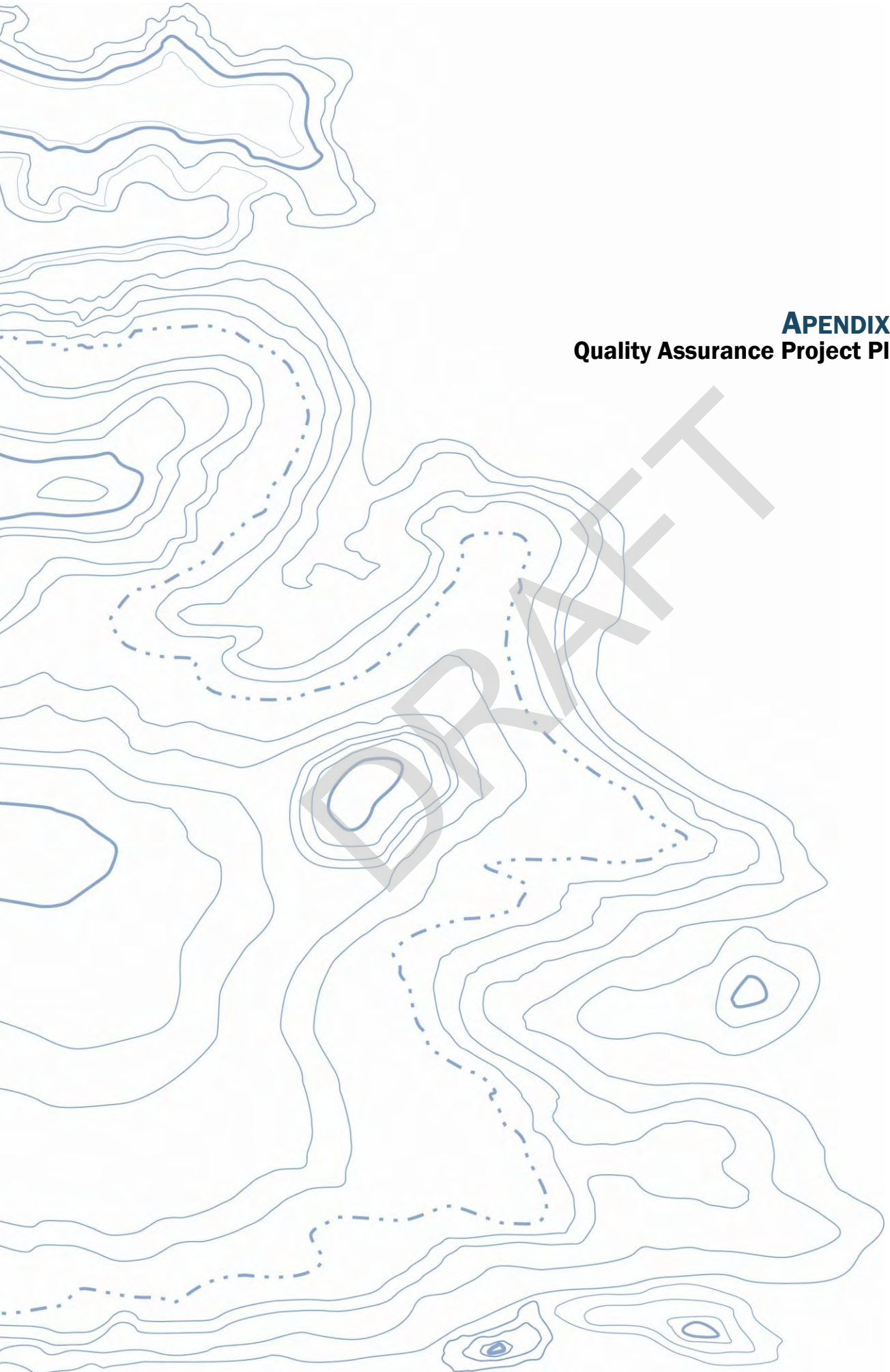
Site Plan

Sampling Analysis Plan
American Plating Site Remediation Project
Tacoma, Washington

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Figure 2

Map Revised: 30 September 2011 amanza
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Office: SEA



APENDIX C
Quality Assurance Project Plan

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Draft Quality Assurance Project Plan (QAPP)

American Plating Site Remediation Project
2110 East D Street
Tacoma, Washington
for
Washington State Department of Ecology

on Behalf of Foss Waterway Development Authority

October 4, 2011

GeoEngineers

1101 South Fawcett Avenue, Suite 200
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30 YEARS 2010

Draft Quality Assurance Project Plan (QAPP) American Plating Site Remediation Project Tacoma, Washington

Project No. 10751-002-01

October 4, 2011

Approved By:

Signature: _____ Date: _____

Iain H. Wingard, Project Manager

Signature: _____ Date: _____

Nick E. Rohrbach, Field Coordinator

Signature: _____ Date: _____

Mark J. Lybeer, Quality Assurance Leader

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NER:IHW:MJL:cn

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1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared for sampling and analysis to be performed as part of the remedial action at the Foss Waterway Development Authority's (FWDA's) American Plating Site (Site) located at 2110 East D Street in Tacoma, Washington. This QAPP serves as the primary guide for the integration of quality assurance (QA) and quality control (QC) functions into the remedial action sampling and analysis activities. The QAPP presents the objectives, procedures, organization, and specific QA/QC activities designed to achieve data quality goals established for the project. Environmental measurements will be conducted to produce data that are scientifically valid, of known and acceptable quality and that meet established objectives. QA/QC procedures will be implemented so that the precision, accuracy, representativeness, completeness and comparability (PARCC) of the data generated meet the specified data quality objectives.

The remedial action at the Site is being conducted by the FWDA to satisfy requirements of a Consent Decree (No. 03 2 14513 6) issued for the Site by the Washington State Department of Ecology (Ecology) to address contamination resulting from releases of metals from former metals plating operations at the Site. The objectives of the remedial action are presented in the Engineering Design Report (EDR) (GeoEngineers, 2011a). Sampling procedures are outlined in the Sampling and Analysis Plan (SAP) included as Appendix B of the Compliance Monitoring Plan (CMP) (GeoEngineers, 2011b). A site-specific Health and Safety Plan (HASP) to be used for field activities is presented in Appendix A of the CMP.

2.0 BACKGROUND

2.1. Problem Definition

Historical metal plating operations at the Site have resulted in releases of metals, cyanide, and vinyl chloride to soil. Previous Toxicity Characteristic Leaching Procedure (TCLP) analyses for metals on soil samples from borings performed at the Site identified the presence of chromium and/or cadmium at concentrations greater than the Toxicity Characteristic criteria (Washington Administrative Code [WAC] 173-303-090) in two areas. The concentrations of metals in soil present at the Site are also greater than the Site cleanup levels. Additionally, Site contaminants have been detected in groundwater at concentrations greater than the Site cleanup levels.

The future use of the Site is as a public park and for public access. Ecology has determined that remedial actions are warranted at the Site to reduce the potential threat to human health and the environment from future Site use. The remedial actions to be performed at the Site include removing soil with chromium and cadmium concentrations greater than the Toxicity Characteristic criteria (WAC 173-303-090), capping the site to prevent direct contact with contaminated soil, and groundwater monitoring to evaluate the long-term effectiveness of the remediation action.

2.2. Site Description

The American Plating Site occupies approximately 1.4 acres of land and is located along the eastern shoreline at the head of the Thea Foss Waterway (Figure 1). The Site is bounded on the

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east by East D Street, on the north by Foss Landing and State Route 509 freeway, on the south by Berge Scaffolding, and on the west by the Foss Waterway (Figure 2).

The Site is relatively flat with an elevation change of approximately three feet across the Site. The Site surface is comprised of fill material of varying thickness. The fill material is present on top of an unconsolidated silt deposit that is underlain by deposits of sand and gravel.

Groundwater is present at the Site at depths ranging from 5 to 9 feet below ground surface (bgs). Groundwater flow is interpreted to be in a northwesterly direction towards, and into, the Thea Foss Waterway. Groundwater in the fill at the Site is influenced by marine water in the Thea Foss Waterway as the groundwater elevations fluctuate with tidal elevations and groundwater is saline (GeoEngineers, 2003).

2.3. Site History

The property has been primarily used for light industrial activities. Puget Sound Plating and Seymour Electroplating occupied the Site between 1955 and 1976. Lewis R. Jones owned the property from 1962 to 2003. During that time, American Plating occupied the Site from 1976 to 1986. All three firms performed metal plating operations.

Between 1986 and 2003 multiple investigations, Site stabilization, and interim actions were performed to investigate the nature and extent of contamination, perform corrective actions, and initiate remedial actions at the Site. In 2003, the FWDA entered into a Prospective Purchaser Consent Decree with Ecology to complete remedial actions at the Site. The procedures specified in this SAP are to be performed during remediation activates implemented as part of the Consent Decree.

2.4. Project Description and Schedule

Remediation activities consist of excavation and off-site disposal as well as capping of soil containing metals concentrations above Site cleanup levels. Additionally, groundwater monitoring will be performed after remediation activities are completed to verify compliance with the groundwater cleanup levels. The objective of the remedial action is to eliminate, reduce, or otherwise control to the extent feasible and practicable, unacceptable risks to human health and the environment posed by metals in soil and groundwater at the Site in accordance with (Model toxics Control Act [MTCA] WAC 173-340) and other applicable regulatory requirements.

Soil and water samples will be collected as part of remedial and compliance monitoring activities for the following purposes:

- Backfill and capping material characterization;
- Limits of soil excavation verification;
- Soil stockpile characterization for disposal;
- Water characterization prior to discharge; and
- Confirmational groundwater monitoring.

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The soil and water samples collected to support remedial activities performed at the American Plating Site will be submitted to Analytical Resources Incorporated (ARI) Laboratory in Tukwila, Washington for chemical analysis. The chemical analyses to be performed will be in accordance with the project-specific requirements specified in the Cleanup Action Plan (CAP) prepared for the site (GeoEngineers, 2003) as well as requirements established for soil disposal and water discharge.

Pending permit approvals, remediation-related construction work is scheduled to begin within 30 days of Ecology approval of the Final EDR. Remediation-related construction work is anticipated to occur over a period of 30 to 60 days beginning in January 2012.

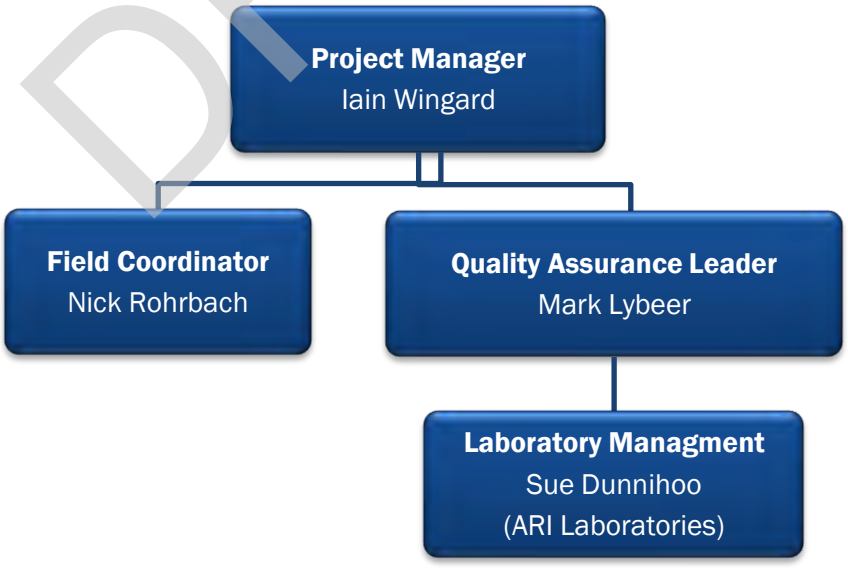
3.0 PROJECT MANAGMENT

3.1. Project Organization and Responsibilities

Descriptions of the responsibilities, lines of authority and communication for the key positions providing QA/QC are shown in the figure below. The project organization facilitates the efficient production of project work, allows for an independent quality review, and permits resolution of any QA issues.

Project Organization Chart

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3.1.1. Project Manager

Iain Wingard is the Project Manager and can be reached at 206.595.7402. The Project Manager has overall responsibility for executing the project in accordance with contractual requirements. The Project Manager is also responsible for selecting project team members, assigning and coordinating project tasks, determining subcontractor participation, establishing and adhering to budgets and schedules, providing technical oversight, and coordinating production and review of project deliverables.

3.1.2. Field Coordinator

Nick Rohrbach is the Field Coordinator and can be reached at 253.732.2138. The Field Coordinator is responsible for the daily management of activities in the field. Specific responsibilities include the following:

- Provides technical direction to the field staff.
- Develops schedules and allocates resources for field tasks.
- Coordinates data collection activities to be consistent with information requirements.
- Supervises the compilation of field data and laboratory analytical results.
- Assures that data are correctly and completely reported.
- Implements and oversees field sampling in accordance with project plans.
- Supervises field personnel.
- Coordinates work with on site subcontractors.
- Schedules sample shipment with the analytical laboratory.
- Monitors that appropriate sampling, testing, and measurement procedures are followed.
- Coordinates the transfer of field data, sample tracking forms, and log books to the Project Manager for data reduction and validation.
- Participates in QA corrective actions as required.

3.1.3. Quality Assurance Leader

Mark Lybeer is the QA Leader and can be reached at 206.239.3227. The QA Leader is responsible for coordinating QA/QC activities as they relate to the acquisition of field data. Specific responsibilities include the following:

- Serves as the official contact for laboratory data QA concerns.
- Reviews and approves the laboratory QA Plan.
- Responds to laboratory data QA needs, answers laboratory requests for guidance and assistance, and resolves issues.
- Monitors laboratory compliance with data quality requirements.
- Ensures that appropriate sampling, testing, and analysis procedures are followed and that proper QC checks are implemented.

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- Reviews the implementation of the QAPP and the overall quality of the analytical data generated.
- Maintains the authority to implement corrective actions as necessary.

3.1.4. Laboratory Management

ARI will provide laboratory analytical services for the project. Sue Dunnihoo is the Laboratory's QA Coordinator for the project and can be reached at 206.695.6200.

The subcontracted laboratory conducting sample analyses for this project is required to obtain approval from the QA Leader before the initiation of sample analysis to assure that the laboratory QA plan complies with the project QA objectives. The Laboratory's QA Coordinator administers the Laboratory QA Plan and is responsible for QC. Specific responsibilities of this position include:

- Ensure implementation of the QA Plan.
- Serve as the laboratory point of contact.
- Activate corrective action for out-of-control events.
- Issue the final QA/QC report.
- Administer QA sample analysis.
- Comply with the specifications established in the project plans as related to laboratory services.
- Participate in QA audits and compliance inspections.

3.2. Health and Safety

A Site-specific HASP will be used for remedial action field activities and is presented in Appendix A of the CMP. The Field Coordinator will be responsible for implementing the HASP during sampling activities. The Project Manager will discuss health and safety issues with the Field Coordinator on a routine basis during the completion of field activities.

The Field Coordinator will terminate any work activities that do not comply with the HASP. Companies providing services for this project on a subcontracted basis will be responsible for developing and implementing their own HASP.

4.0 DATA QUALITY OBJECTIVES

The quality assurance objective for technical data is to collect environmental monitoring data of known, acceptable, and documentable quality. The QA objectives established for the project are:

- Implement the procedures outlined herein for field sampling, sample custody, equipment operation and calibration, laboratory analysis, and data reporting that will facilitate consistency and thoroughness of data generated.
- Achieve the acceptable level of confidence and quality required so that data generated are scientifically valid and of known and documented quality. This will be performed

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by establishing criteria for precision, accuracy, representativeness, completeness, and comparability, and by testing data against these criteria.

The sampling design, field procedures, laboratory procedures, and QC procedures are set up to provide high-quality data for use in this project. Specific data quality factors that may affect data usability include quantitative factors (bias, detection limits, precision, accuracy and completeness) and qualitative factors (representativeness and comparability). The measurement quality objectives (MQO) associated with the data quality factors are summarized in Table 1 and are discussed below.

4.1. Detection Limits

Analytical methods have quantitative limitations at a given statistical level of confidence that are often expressed as the method detection limit (MDL). Although results reported near the MDL provide insight to Site conditions, quality assurance dictates that analytical methods achieve a consistently reliable level of detection known as the practical quantitation limit (PQL), which is typically demonstrated with the lowest point of a linear calibration. The contract laboratory will provide numerical results for all analytes and report them as detected above the PQL or undetected at the PQL.

The reporting limits for Chemicals of Potential Concern (COPCs) for soil and water samples to be collected as part of remediation and compliance monitoring activities are presented in Tables 2 through Table 6. These reporting limits were obtained from an Ecology-certified laboratory (i.e., ARI Laboratory). The reporting limits presented in Tables 2 and 6 are the laboratory PQLs that are considered target reporting limits (TRLs) because several factors may influence final reporting limits. First, moisture and other physical conditions of soil affect detection limits. Second, analytical procedures may require sample dilutions or other practices to accurately quantify a particular analyte at concentrations above the range of the instrument. The effect is that other analytes could be reported as undetected but at a value higher than a specified TRL. Data users must be aware that high non-detect values, although correctly reported, can bias statistical summaries and careful interpretation is required to correctly characterize Site conditions.

4.2. Precision

Precision is the measure of mutual agreement among replicate or duplicate measurements of an analyte from the same sample and applies to field duplicate or split samples, replicate analyses, and duplicate spiked environmental samples (matrix spike duplicates). The closer the measured values are to each other, the more precise the measurement process. Precision error may affect data usefulness. Good precision is indicative of relative consistency and comparability between different samples. Precision will be expressed as the relative percent difference (RPD) for spike sample comparisons of various matrices and field duplicate comparisons for soil and catch basin solids and water samples.

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This value is calculated by:

Where $$RPD\,(\%) = \frac{|D_1 - D_2|}{(D_1 + D_2)/2} X\ 100,$$

D_1 = Concentration of analyte in sample.

D_2 = Concentration of analyte in duplicate sample.

The calculation applies to split samples, replicate analyses, duplicate spiked environmental samples (matrix spike duplicates), and laboratory control duplicates. The RPD will be calculated for samples and compared to the applicable criteria. Precision can also be expressed as the percent difference (%D) between replicate analyses. Persons performing the evaluation must review one or more pertinent documents (USEPA, 1999; USEPA, 2004) that address criteria exceedances and courses of action. Project RPD goals for all analyses are 35 percent for water samples and 50 percent for soil samples, unless the primary and duplicate sample results are less than 5 times the MRL, in which case RPD goals will not apply for data quality assessment purposes.

4.3. Accuracy

Accuracy is a measure of bias in the analytic process. The closer the measurement value is to the true value, the greater the accuracy. This measure is defined as the difference between the reported values versus the actual value and is often measured with the addition of a known compound to a sample. The amount of known compound reported in the sample, or percent recovery, assists in determining the performance of the analytical system in correctly quantifying the compounds of interest. Since most environmental data collected represent one point spatially and temporally rather than an average of values, accuracy plays a greater role than precision in assessing the results. In general, if the percent recovery is low, non-detect results may indicate that compounds of interest are not present when in fact these compounds are present. Detected compounds may be biased low or reported at a value less than actual environmental conditions. The reverse is true when recoveries are high. Non-detect values are considered accurate while detected results may be higher than the true value.

For this project, accuracy will be expressed as the percent recovery of a known surrogate spike, matrix spike, or laboratory control sample (blank spike), concentration:

$$Recovery\,(\%) = \frac{Spiked\,Result - Unspiked\,Result}{Known\,Spike\,Concentration}\ X\ 100$$

Persons performing the evaluation must review one or more pertinent documents (USEPA, 1999; USEPA, 2004) that address criteria exceedances and courses of action. Accuracy criteria for surrogate spikes, matrix spikes, and laboratory control spikes are found in Table 1 of this QAPP.

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4.4. Representativeness

Representativeness expresses the degree to which data accurately and precisely represent the actual Site conditions. The determination of the representativeness of the data will be performed by completing the following:

- Comparing actual sampling procedures to those delineated within the SAP and this QAPP.
- Comparing analytical results of field duplicates to determine the variations in the analytical results.
- Invalidating non-representative data or identifying data to be classified as questionable or qualitative.

Only representative data will be used in subsequent data reduction, validation, and reporting activities.

4.5. Completeness

Completeness establishes whether a sufficient amount of valid measurements were obtained to meet project objectives. The number of samples and results expected establishes the comparative basis for completeness. Completeness goals are 90 percent useable data for samples/analyses planned. If the completeness goal is not achieved an evaluation will be made to determine if the data are adequate to meet study objectives.

$$Completeness = \frac{number\ of\ valid\ measurements}{total\ number\ of\ data\ points\ planned} \times 100$$

4.6. Comparability

Comparability expresses the confidence with which one set of data can be compared to another. Although numeric goals do not exist for comparability, a statement on comparability will be prepared to determine overall usefulness of data sets, following the determination of both precision and accuracy.

4.7. Holding Times

Holding times are defined as the time between sample collection and extraction, sample collection and analysis, or sample extraction and analysis. Some analytical methods specify a holding time for analysis only. For many methods, holding times may be extended by sample preservation techniques in the field. If a sample exceeds a holding time, then the results may be biased low. For example, if the extraction holding time for volatile analysis of soil sample is exceeded, then the possibility exists that some of the organic constituents may have volatilized from the sample or degraded. Results for that analysis would be qualified as estimated to indicate that the reported results may be lower than actual Site conditions. Holding times are presented in Table 7.

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4.8. Blanks

According to the *National Functional Guidelines for Organic Data Review* (USEPA, 1999), "The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. The criteria for evaluation of blanks apply to any blank associated with the samples (e.g., method blanks, instrument blanks, trip blanks, and equipment blanks)." Trip blanks are placed with samples during shipment and travel with samples from the laboratory to the field and back to the laboratory. Method blanks are created during sample preparation and follow samples throughout the analysis process.

Analytical results for blanks will be interpreted in general accordance with *National Functional Guidelines for Organic Data Review* (USEPA, 1999) and professional judgment.

4.9. Special Training Requirements/Certification

The Superfund Amendments and Reauthorization Act of 1986 required the Secretary of Labor to issue regulations providing health and safety standards and guidelines for workers engaged in hazardous waste operations. Occupational Safety and Health Administration (OSHA) regulations (29 CFR 1910.120) require training to provide employees with the knowledge and skills necessary to enable them to perform their jobs safely and with minimum risk to their personal health. All sampling personnel will have completed the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and 8-hour refresher courses, as necessary, to meet OSHA regulations.

5.0 DOCUMENTATION AND RECORDS

5.1. Field observations

Field documentation provides important information about potential problems or special circumstances surrounding sample collection. Field personnel will maintain daily field logs. The field logs will be prepared on field report forms or in a bound logbook. Entries in the field logs and associated sample documentation forms will be made in waterproof ink, and corrections will consist of line-out deletions that are initialed and dated. Individual logbooks will become part of the project files at the conclusion of the field work.

At a minimum, the following information will be recorded during the collection of each sample.

- Sample location and description
- Site or sampling area sketch showing sample location and measured distances
- Sampler's name(s)
- Date and time of sample collection
- Designation of sample as composite or discrete
- Sample matrix (soil or water)
- Type of sampling equipment used
- Field instrument (e.g., PID) readings

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- Field observations and details that are pertinent to the integrity/condition of the samples (e.g., weather conditions, performance of the sampling equipment, sample depth control, sample disturbance, etc.)
- Preliminary sample descriptions (e.g., lithology, field screening results)
- Sample preservation
- Sample transport/shipping arrangements
- Name of recipient laboratory

In addition to the sampling information, the following specific information also will be recorded in the field log for each day of sampling.

- Sampling team members
- Time of arrival/entry on Site and time of Site departure
- Other personnel present at the Site
- Summary of pertinent meetings or discussions with regulatory agency or contractor personnel
- Deviations from sampling plans, QAPP procedures, and HASP
- Changes in field personnel and responsibilities with reasons for the changes
- Levels of safety protection
- Calibration readings for any field instruments used

The handling, use, and maintenance of field log books are the Field Coordinator's responsibility.

5.2. Analytical chemistry records

Laboratories will be responsible for internal checks on data reporting and will correct errors identified during the QA review. All laboratories must be accredited by Ecology for the required analytical methods. Close contact will be maintained with the laboratories to resolve any quality control problems in a timely manner. The laboratories will be required to provide the following:

- **Project Narrative –** This summary, in the form of a cover letter, will present any problems encountered during any aspect of analysis. The summary will include, but not be limited to, a discussion of QC, sample shipment, sample storage, and analytical difficulties. Any problems encountered by the laboratory, and their resolutions, will be documented in the project narrative.
- **Records –** Legible copies of the chain-of-custody (COC) forms will be provided as part of the data package. This documentation will include the time of receipt and the condition of each sample received by the laboratory. Additional internal tracking of sample custody by the laboratory will also be documented.
- **Sample Results –** The data package will summarize the results for each sample analyzed. The summary will include the following information, as applicable:

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- Field sample identification code and the corresponding laboratory identification code
- Sample matrix
- Date of sample extraction/digestion
- Date and time of analysis
- Weight and/or volume used for analysis
- Final dilution volumes or concentration factor for the sample
- Total solids in the samples
- Identification of the instruments used for analysis
- MDLs and RLs
- All data qualifiers and their definitions

- **QA/QC Summaries –** These summaries will contain the results of all QA/QC procedures. Each QA/QC sample analysis will be documented with the same information as that required for the sample results (see above). The laboratory will make no recovery or blank corrections. The required summaries are listed below.
  - The calibration data summary will contain the concentrations of the initial calibration and daily calibration standards and the date and time of analysis. The response factor, percent standard deviation (%RSD), RPDs, and retention time for each analyte will be listed, as appropriate. Results for standards analyzed at the RL to determine instrument sensitivity will be reported.
  - The internal standard area summary will report the internal standard areas, as appropriate.
  - The method blank analysis summary will report the method blank analysis associated with each sample and the concentrations of all compounds of interest identified in these blanks.
  - The surrogate spike recovery summary will report all surrogate spike recovery data for organic analyses. The names and concentrations of all compounds added, percent recoveries, and QC limits will be listed.
  - The matrix spike (MS) recovery summary will report the MS or MS duplicate (MSD) recovery data for analyses, as appropriate. The names and concentrations of all compounds added, percent recoveries, and QC limits will be included in the data package. The RPD for all MS/MSD analyses will be reported.
  - The laboratory replicate summary will report the RPD for all laboratory replicate analyses. The QC limits for each compound or analyte will be listed.
  - The laboratory control sample (LCS) analysis summary will report the results of the analyses of the LCS. The QC limits for each compound or analyte will be included in the data package.
  - The relative retention time summary will report the relative retention times for the primary and confirmational columns of each analyte detected in the samples, as appropriate.

EQuIS four-file format electronic data deliverables will be obtained from the laboratory and data will be submitted into Ecology's Environmental Information Management (EIM) system after data quality assessments are completed.

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5.3. Data Reduction

Data reduction is the process by which original data are converted or reduced to a specified format or unit to facilitate the analysis of the data. For example, a final analytical concentration may need to be calculated from a diluted sample result. Data reduction requires that all aspects of sample preparation that could affect the test result, such as sample volume analyzed or dilutions required, be taken into account in the final result. The laboratory personnel will reduce the analytical data for review by the Quality Assurance Leader and Project Manager.

During chemical analysis, samples are occasionally diluted after the initial analysis if the estimated concentration curve for one or more of the target analytes is above the calibration curve. In these instances, concentrations from the initial analysis will be identified as the "best result" for all target analytes other than the chemical(s) that was originally above the calibration range. The "best result" for this qualified analyte(s) will be taken from the diluted sample.

6.0 DATA GENERATION AND ACQUISITION

6.1. Sample Process Design

The following sections describe the sampling process design that will be used during cleanup activities and groundwater compliance monitoring to characterize soil and water at the Site.

6.2. Backfill and Capping Material Characterization

Samples of backfill and capping material will be collected and analyzed to verify that the material meets the Site cleanup levels. Samples of the backfill and capping materials will be collected from stockpiles located at the source's facility. Each sample of a proposed backfill or capping material will be comprised of three aliquots of the material collected from three locations around a material stockpile. At each location approximately 6 inches of material present at the surface of the stockpile will be removed prior to collecting a sample aliquot. Then an aliquot of the material will be collected using a clean (i.e., decontaminated) stainless steel spoon/trowel or directly using a clean, gloved hand (i.e., hand covered by a new nitrile glove) and placed in a clean stainless steel bowl. Three equal sized aliquots will be placed in the bowl and homogenized to prepare a backfill or capping material sample.

6.3. Limits of Soil Excavation Verification

Samples will be collected from the sidewalls and base (i.e., bottom) of two remedial excavation areas to verify that soil with concentrations greater than the Toxicity Characteristic criteria has been removed. When the limits of excavation have been reached based on field screening, samples will be collected from the sidewalls and bottom of each excavation. A sample will be collected from each 50 lineal feet along each sidewall and from each 2,500 square feet (sf) (i.e., equivalent to 50 by 50 foot area) of excavation bottom in each excavation area. Soil samples collected from excavations that are less than approximately 4 feet in depth will be collected by field personnel by directly entering the excavation if it is safe to do so and using a clean stainless steel spoon/trowel or directly using a clean, gloved hand and placed in a clean stainless steel bowl. If it is not safe to enter an excavation, or where the excavation is deeper than 4 feet bgs, samples will be collected from material removed from the sample area by the excavation equipment and

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presented in the excavator bucket. The samples will be collected using a clean stainless steel spoon/trowel or directly using a clean, gloved hand and placed in a clean stainless steel bowl and homogenized prior to sample collection.

6.4. Soil Stockpile Characterization for Disposal

Samples of stockpiled soil removed from the two soil excavation areas will be collected and analyzed to characterize the stockpiled soil for disposal. At each stockpile sample location approximately 6 inches of material present at the surface of the stockpile will be removed prior to collecting a sample. Then a sample of the stockpiled material will be collected using a clean, stainless steel spoon/trowel or directly using a clean, gloved hand and placed in a clean stainless steel bowl. The sample material will then be homogenized prior to sample collection.

6.5. Water Characterization Prior to Discharge

It is anticipated that storm water that comes in contact with contaminated soil that is contained as part of the remedial action and any water resulting from dewatering of excavations on the Site will be discharged to the City of Tacoma sanitary sewer. Samples of the storm water and dewatering water would be collected and analyzed to characterize the water for discharge to the City of Tacoma sanitary sewer. A sample of the water would be collected from a discharge port on a tank or from within the tank or containment structure using a poly water bailer.

6.6. Confirmational Groundwater Monitoring

Following the completion of the remedial action, groundwater samples will be collected from the Site and analyzed to evaluate the long-term effectiveness of the remedial action. The groundwater samples will be collected from wells installed at the conditional point of compliance located adjacent to the Thea Foss Waterway. Monitoring wells currently present at the Site will be decommissioned as part of the remedial action. New, replacement monitoring wells will be installed at the conditional point of compliance. The new wells will be installed to monitor shallow groundwater quality conditions. Groundwater samples will be collected from monitoring wells using submersible or peristaltic pumps and low-flow sampling procedures.

6.7. Sample Methods

6.7.1. Sampling Equipment and Decontamination Procedures

Soil samples will be collected using excavation equipment (i.e., excavator) and/or hand tools including stainless steel spoons and stainless steel mixing bowls. Samples of storm water and dewatering water would be collected directly into the sample bottles from a discharge port on a tank or from within the tank or containment structure using a poly water bailer. Groundwater samples will be collected from monitoring wells using submersible or peristaltic pumps and low-flow sampling procedures.

Reusable sampling equipment that comes in contact with soil or water will be decontaminated before each use. Decontamination procedures for this equipment will consist of the following:

1. Washing with a brush and non-phosphate detergent solution (e.g., Liqui-Nox and distilled water);

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2. Rinsing with distilled water; and
3. Wrapping or covering the decontaminated equipment with aluminum foil. Field personnel will limit cross-contamination by changing gloves between sampling locations.

Wash water used to decontaminate the reusable sampling equipment will be collected and stored on site in 55-gallon drums.

6.7.2. Field Screening Procedures

The potential presence of contamination in soil samples will be evaluated using field screening techniques. Field screening results will be recorded on the field logs and the results will be used as a general guideline to delineate areas of possible contamination. Visual screening methods consisting of observations for unusual color and/or staining indicative of possible contamination will be used during the remedial action.

6.7.3. Sample Containers and Labeling

The Field Coordinator will establish field protocol to manage field sample collection, handling, and documentation. Soil and water samples will be placed in appropriate laboratory-prepared containers. Sample containers and preservatives are listed in Table 7.

Sample containers will be labeled with the following information at the time of sample collection:

- Project name and number
- Type of sample preservative used (where applicable)
- Sample identification, which will include a reference to date and sampling depth (if applicable)
- Date and time of collection

The sample collection activities will be noted in the field log books. The Field Coordinator will monitor consistency between sample containers/labels, field log books, and chain-of-custody (COC) forms.

6.8. Sample Handling and Custody

6.8.1. Sample Storage

Samples will be placed in a cooler with ice after they are collected. The objective of the cold storage will be to attain a sample temperature of 2 to 6 degrees Celsius. Holding times (Table 7) will be observed during sample storage.

6.8.2. Sample Shipment

Samples will be transported and delivered to the analytical laboratory in the sample coolers. The samples will either be transported by field personnel, laboratory personnel, or by courier service. The Field Coordinator will ensure that the cooler has been properly secured using clear plastic tape and custody seals.

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6.8.3. Chain-of-Custody (COC) Records

Field personnel are responsible for the security of samples from the time the samples are collected until the samples have been received by the courier service or laboratory personnel. A COC form will be completed for each group of samples being shipped to the laboratory. Information to be included on the COC form includes:

- Project name and number;
- Sample identification numbers;
- Date and time of sampling;
- Sample matrix (soil and water), preservative, and number of containers for each sample;
- Analyses to be performed;
- Names of sampling personnel;
- Project manager name and contact information including phone number; and
- Shipping information including shipping container number, if applicable.

The original COC form will be signed by a member of the field team. Field personnel will retain copies and place the original and remaining copies in a plastic bag. The plastic bag containing the COC form will be placed in the cooler before sealing the cooler for transport to the laboratory.

6.8.4. Laboratory Custody Procedures

The laboratory will follow their standard operating procedures (SOPs) to document sample handling from time of receipt (sample log-in) to reporting. Documentation will include, at a minimum, the analyst's name or initials, time, and date.

6.9. Analytical Methods

The methods of chemical analysis are identified in Tables 2 and 6. All methods selected represent standard methods used for the analysis of these analytes in soil and water. The laboratory project manager will determine the remedy to be used if the project RLs cannot be attained, in consultation with the Quality Assurance Leader.

6.10. Quality Control

Table 8 summarizes the types and frequency of QC samples to be analyzed, including both field QC and laboratory QC samples.

6.10.1. Field Quality Control

Field QC samples serve as a control and check mechanism to monitor the consistency of field sampling methods and the potential influence of off-site factors on project samples. Examples of off site factors include airborne VOCs and contaminants that may be present in potable water used during drilling activities. Table 8 summarizes the types and frequency of field QC samples to be analyzed and the following sections discuss field QC samples.

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6.10.1.1. FIELD DUPLICATES

Field duplicates serve as a measure for precision. Under ideal field conditions, field duplicates (sometimes referred to as splits), are created by thoroughly mixing a volume of the sample matrix, placing aliquots of the mixed sample in separate containers, and identifying one of the aliquots as the primary sample and the other as the duplicate sample. Field duplicates measure the precision and consistency of laboratory analytical procedures and methods, as well as the consistency of the sampling techniques used by field personnel.

One field duplicate will be collected for every ten soil samples. For groundwater, one field duplicate will be collected for every sampling event given that less than ten samples will be collected as part of each sampling event.

6.10.1.2. TRIP BLANKS

Trip blanks accompany samples for volatile organic compound (VOC) analysis during field sampling and delivery to the laboratory. Trip blanks typically are analyzed at a rate of one trip blank per cooler containing samples for VOC analysis. Trip blanks will be analyzed for soil samples collected to characterize backfill and capping material during this investigation.

6.11. Laboratory Quality Control

Laboratory QC procedures will be evaluated through a formal data quality assessment process. The analytical laboratory will follow standard analytical method procedures that include specified QC monitoring requirements. These requirements will vary by method, but generally include:

- Method blanks
- Internal standards
- Instrument calibrations
- Matrix spike/matrix spike duplicates (MS/MSD)
- Laboratory control samples/laboratory control sample duplicates (LCS/LCSD)
- Laboratory replicates or duplicates
- Surrogate/Labeled compounds

6.11.1. Laboratory Blanks

Laboratory procedures utilize several types of blanks, but the most commonly used blanks for QC monitoring are method blanks. Method blanks are laboratory QC samples that consist of either a soil-like material having undergone a contaminant destruction process, or reagent (contaminant-free) water. Method blanks are extracted and analyzed with each batch of environmental samples undergoing analysis. If a substance is detected in a method blank, then one (or more) of the following occurred:

- Sample containers, measurement equipment, and/or analytical instruments were not properly cleaned and contained contaminants.
- Reagents used in the process were contaminated with a substance(s) of interest.

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It is difficult to determine which of the above scenarios took place if blank contamination occurs. However, it is assumed that the conditions that affected the blanks also likely affected the project samples. If target analytes are detected in method blanks, data validation guidelines assist in determining which substances in project samples are considered "real," and which ones are attributable to the analytical process. Furthermore, the guidelines state, ". . . there may be instances where little or no contamination was present in the associated blank, but qualification of the sample is deemed necessary. Contamination introduced through dilution water is one example."

6.11.2. Calibrations

Several types of instrument calibrations are used, depending on the analytical method, to assess the linearity of the calibration curve and assure that the sample results reflect accurate and precise measurements. The main calibrations used are initial calibrations, daily calibrations, and continuing calibration verification.

6.11.3. Matrix Spike/Matrix Spike Duplicates (MS/MSD)

MS/MSD samples are used to assess influences or interferences caused by the physical or chemical properties of the sample itself. For example, extreme pH can affect the results for semivolatile organic compounds. Or, the presence of a particular compound may interfere with accurate quantitation of another analyte. MS/MSD data is reviewed in combination with other QC monitoring data to determine matrix effects. In some cases, matrix effects cannot be determined due to dilution and/or high levels of related substances in the sample. A matrix spike is evaluated by spiking a project sample with a known amount of one or more of the target analytes, ideally at a concentration that is 5 to 10 times higher than the sample result. A percent recovery is then calculated by subtracting the un-spiked sample result from the spiked sample result, dividing by the known concentration of the spike, and multiplying by 100.

MS/MSD samples will be analyzed at a frequency of one MS/MSD per analytical batch. The samples for the MS/MSD analyses should be collected from a sampling location that is believed to have only low-level contamination. A sample from an area of low-level contamination is needed because the objective of MS/MSD analyses is to determine the presence of matrix interferences, which can best be achieved with low levels of contaminants. Additional sample volume will be collected for the MS/MSD analyses as required by the laboratory.

6.11.4. Laboratory Control Sample/ Laboratory Control Sample Duplicates (LCS/LCSD)

Also known as blanks spikes, laboratory control samples (LCS) are similar to MS samples in that a known amount of one or more of the target analytes are spiked into a prepared sample medium, and a percent recovery of the spiked substances is calculated. The primary difference between LCS and MS samples is that the LCS uses a contaminant-free sample medium. For example, reagent water is typically used for LCS water analyses. The purpose of an LCS is to help assess the overall accuracy and precision of the analytical process including sample preparation, instrument performance, and analyst performance.

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6.11.5. Laboratory Replicates/Duplicates

Laboratories utilize MS/MSDs, LCS/LCSDs, and/or replicates to assess precision. Replicates are a second analysis of a field-collected environmental sample. Replicates can be split at varying stages of the sample preparation and analysis process and most commonly consist of a second analysis on the extracted media.

6.11.6. Surrogates/Labeled Compounds

Surrogate spikes are used to verify proper extraction procedures and the accuracy of the analytical instrument. Surrogates are substances with characteristics similar to the target analytes. A known concentration of surrogate is added to the project sample and passed through the instrument and the percent recovery is calculated. Each surrogate used has acceptance limits (i.e., an acceptable range) for percent recovery. If a surrogate recovery is low, sample results may be biased low and depending on the recovery value, a possibility of false negatives may exist. Conversely, when recoveries are above the specified acceptance limits, a possibility of false positives exist, although non-detect results are considered accurate.

6.12. Instrument Testing, Inspection and Maintenance

The field coordinator will be responsible for overseeing the testing, inspection, and maintenance of all field equipment. The laboratory project manager will be responsible for laboratory equipment testing, inspection, and maintenance requirements. The calibration methods used in calibrating the analytical instrumentation are described in the following section.

6.13. Instrument Calibration and Frequency

6.13.1. Field Instrumentation

Field instrument calibration and calibration checks facilitate accurate and reliable field measurements. The calibration of field instruments used on the project will be checked and adjusted as necessary in general accordance with the manufacturer's recommendations. Methods and intervals of calibration checks and instrument maintenance will be based on the type of instrument, stability characteristics, required accuracy, intended use, and environmental conditions. The basic calibration check frequencies are described below.

6.13.2. Laboratory Instrumentation

For chemical analytical testing, calibration procedures will be performed in general accordance with the analytical methods used and the laboratory's SOPs. Calibration documentation will be retained at the laboratory.

All instrument calibrations and their appropriate chemical standards are to comply with the specific methods within EPA SW-846, Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, 3rd Edition, December 1996 and the Laboratory SOPs. Calibration documentation, initial (ICALs) and continuing (CCALs), will be retained at the Laboratory.

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6.14. Inspection of Supplies and Consumables

Supplies and consumables for the field sampling effort will be inspected upon delivery and accepted if the condition of the supplies is satisfactory. For example, jars will be inspected to ensure that they are the correct size and quantity and were not damaged in shipment.

6.15. Data Management

Laboratories will report data in formatted hardcopy and digital formats. Analytical laboratory measurements will be recorded in standard formats that display, at a minimum, the field sample identification, the laboratory identification, reporting units, data qualifiers, analytical method, analyte tested, analytical result, extraction and analysis dates, and quantitation limits. Each sample delivery group will be accompanied by sample receipt forms and a case narrative identifying data quality issues. Laboratory electronic data deliverable (EDD) requirements will be established by GeoEngineers, Inc. with the contract laboratory. The laboratory will send final analytical testing results to the Project Manager.

Following completion of the remedial action and post-construction monitoring, the relevant data generated as part of the project will be reported to Ecology as required by the Consent Decree.

7.0 ASSESSMENT AND OVERSIGHT

7.1. Assessment and Response Actions

7.1.1. Review of Field Documentation and Laboratory Receipt Information

Documentation of field sampling data will be reviewed periodically for conformance with project QC requirements described in this QAPP. At a minimum, field documentation will be checked for proper documentation of the following:

- Sample collection information (date, time, location, matrices, etc.);
- Field instruments used and calibration data;
- Sample collection protocol;
- Sample containers, preservation, and volume;
- Field QC samples collected at the frequency specified;
- COC protocols; and
- Sample shipment information.

Sample receipt forms provided by the laboratory will be reviewed for QC exceptions. The final laboratory data package will describe (in the case narrative) the effects that any identified QC exceptions have on data quality. The laboratory will review transcribed sample collection and receipt information for correctness prior to delivering the final data package.

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7.1.2. Response Actions for Field Sampling

The Field Coordinator, or a designee, will be responsible for correcting equipment malfunctions throughout the field sampling effort and resolving situations in the field that may result in nonconformance or noncompliance with the QAPP. All corrective measures will be documented in the field logbook.

7.1.3. Corrective Action for Laboratory Analyses

Laboratories are required to comply with their current written standard operating procedures. The laboratory project manager will be responsible for ensuring that appropriate corrective actions are initiated as required for conformance with this QAPP. All laboratory personnel will be responsible for reporting problems that may compromise the quality of the data to the laboratory project manager. A narrative describing the anomaly, the steps taken to identify and correct it and the treatment of the relevant sample batch (i.e., recalculation, reanalysis, and re-extraction) will be submitted with the data package.

8.0 DATA VALIDATION AND USABILITY

8.1. Data Review, Verification and Validation

The data validation and usability elements of the QAPP as detailed below address the QA/QC activities that occur after data collection and/or data generation is complete. Implementation of these elements ensures that the data conform to the specified criteria and will achieve the project objectives

The data are not considered final until validated. All data, including laboratory and field QC sample results, will be summarized in a data validation report. The data validation report will focus on data that did not meet the MQOs specified in Table 1. The data validation reports will be included as an appendix to the Remedial Action Construction Report. The data report will also describe any deviations from this QAPP and actions taken to address those deviations.

Level III laboratory data packages will be obtained for all soil and water samples. These data will be reviewed for the following QC parameters:

- Holding times and sample preservation
- Method blanks
- MS/MSD analyses
- LCS/LCSD analyses
- Surrogate spikes
- Duplicates/replicates
- Field/Lab duplicates
- Calibrations (Initial and Continuing)
- Internal Standards

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- Instrument Tunes

In addition to these QC parameters, other documentation such as sample receipt forms and case narratives will be reviewed to evaluate laboratory QA/QC.

8.2. Verification and Validation Methods

Hard-copy laboratory reports will be generated providing the analysis-specific information including final sample analytical results, reportable field and laboratory QA/QC analytical results, MDLs and MRLs. The laboratory data will also be reported via electronic media using the tabular outputting capabilities of standard software formats.

The term "reporting limit" will be used interchangeably with "quantitation limit" to mean the lowest concentration at which an analyte can be quantified subject to the quality control criteria of the analytical method. These terms are different from "MDL," which refers to the lowest concentration that the analytical method can ideally detect.

Data validation qualifiers including "U," "J,", and "R" will be used following the reported laboratory results to explain data quality issues affecting the laboratory data to the data user. These qualifiers are explained as follows:

- "U" indicates that a compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit, which is corrected for dilution and percent moisture.
- "J" indicates that a compound was detected below the reporting limit and the value is estimated or the value was estimated by the validator because of the instrument bias reasons.
- If any target analytes are found in a laboratory method blank, it will be regarded as blank contamination. In these cases, the result of a given analyte in the method blank will be compared to any positive result of the same analyte in the associated field samples. If a field sample result is less than five times (ten times for common laboratory contaminants like acetone, phthalates, etc.) the result that is reported in the method blank, the result will be considered blank contamination. Accordingly, the result will be qualified as not-detected "U" at the elevated reporting limit.
- If there are two analyses reported by the laboratory for one sample (as in the case of dilutions), the validator will make a decision as to which analysis to use in the final assessment. As there should be only one reported result per analyte for a given sample, any extraneous results will be qualified as not-reportable "R" and will not be used.

8.3. Reconciliation with User Requirements

A data quality assessment will be conducted by the project Quality Assessment Leader to identify cases where the projects MQOs were not met.

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9.0 REFERENCES

GeoEngineers, Inc. (2011a). Engineering Design Report, American Plating Site, 2110 East D Street, Tacoma, Washington GEI File No. 10751-002-01, dated TBD.

GeoEngineers, Inc. (2011b). Compliance Monitoring Plan, American Plating Site, 2110 East D Street, Tacoma, Washington. GEI File No. 0751-002-01, dated September 30, 2011.

GeoEngineers, Inc. (2003). Draft Final Cleanup Action Plan, Former American Plating Site Inc., 2110 East D Street, Tacoma, Washington. GEI File No. 10751-002-00, dated November 24, 2003.

Washington State Department of Ecology (Ecology). Minimum Standards for Construction and Maintenance of Wells, Chapter 173-160 WAC, update November 2006.

Washington State Department of Ecology (Ecology). Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies. July 2004.

U.S. Environmental Protection Agency (USEPA). Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, EPA-540-R-08-01. June 2008.

U.S. Environmental Protection Agency (USEPA). Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, OSWER 9240.1-45, EPA 540-R-04-004. October 2004.

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Table 1

Measurement Quality Objectives

American Plating Site Remediation Project
Tacoma, Washington

Laboratory Analysis	Reference Method	QC Check Standards (Laboratory Control Samples & Matrix Spike Samples) Limits			Surrogate Standards (SS) %R Limits[1]	Field Duplicate Samples RPD Limits[2]	
		Soil %R[1]	Water %R[1]	RPD% *Both Soil/Water*	Soil/Water	Soil	Water
Total Metals	6010 - ICP-OES, 200.8 ICPMS 7470/7471 CVA	75-125	75-125	20	NA	≤50%	≤35%
TCLP Metals	6010 - ICP-OES/7470-CVA	75-125	75-125	20	NA	≤50%	≤35%
Gasoline-range petroleum hydrocarbons	NW-TPHg	74-125	75-125	50	62-134 / 79-120	≤50%	≤35%
Diesel- and oil-range petroleum hydrocarbons	NW-TPHDx	61-119	64-112	50	50-150	≤50%	≤35%
WAD Cyanide	SM4500 CN I	75-125	75-125	20	NA	≤50%	≤35%
Volatile Organic Compounds	SW8260B	10-191	69-126	50	64-152/80-120	≤50%	≤35%
Semi-Volatile Organic Compounds	SW8270D	30-160	10-169	50	30-160 / 11-132	≤50%	≤35%
Polychlorinated Biphenyls (PCBs)	SW8082B	52-126	76-186	50	40-130/ 19-118	≤50%	≤35%
Pesticides	SW8081A	21-148	10-126	50	26-143 / 32-116	≤50%	≤35%

Notes:

[1] Percent recovery limits are compound-specific and based on laboratory studies. The surrogate %R and laboratory control/matrix spike sample %R control limits presented are the ranges for all of the individual analytes in the identified analysis. The individual control limits will be provided with the laboratory report for each analysis.

[2] RPD control limits are only applicable if the concentrations are greater than 5 times the method reporting limit (MRL). For results less than 5 times the MRL, the difference between the sample and duplicate must be less than 2 times the MRL for soils and 1 times the MRL for waters.

%R = Percent recovery

RPD = Relative Percent Difference

NA = Not Applicable

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Table 2

Methods of Analysis and Target Reporting Limits for Backfill Confirmation Soil Samples

American Plating Site Remediation Project

Tacoma, Washington

Analyte	Analytical Method	Target Report Limit[1]	Laboratory Reporting Limit
Total Metals (mg/kg)			
Antimony	6010 - ICP-OES	NE	5.0
Arsenic	6010 - ICP-OES	20[2]	5.0
Beryllium	6010 - ICP-OES	NE	0.1
Cadmium	6010 - ICP-OES	2[2]	0.2
Chromium	6010 - ICP-OES	2,000 [2]	0.5
Hexavalent Chromium	EPA 3500-Cr B	19 [2]	0.1
Copper	6010 - ICP-OES	NE	0.2
Lead	6010 - ICP-OES	250[2]	2.0
Mercury	7471A-CVAA	2[2]	0.5
Nickel	6010 - ICP-OES	1,600	0.2
Selenium	6010 - ICP-OES	400	0.2
Silver	6010 - ICP-OES	400	2
Thallium	6010 - ICP-OES	NE	5.0
Zinc	6010 - ICP-OES	NE	1.0
Petroleum Hydrocarbons (mg/kg)			
Gasoline-range petroleum hydrocarbons	NW--TPH-G	30/100[2,3]	5
Diesel- and oil-range petroleum hydrocarbons	NW-TPHDx	2000[2]	5
Volatile Organic Compounds (µg/kg)			
1,1,1,2-Tetrachloroethane	SW8260B	38,000	1.0
1,1,1-Trichloroethane	SW8260	2000[2]	1.0
1,1,2,2-Tetrachloroethane	SW8260	5,000	1.0
1,1,2-Trichloroethane	SW8260	18,000	1.0
1,1-Dichloroethane	SW8260	NE	1.0
1,1-Dichloroethene	SW8260	NE	1.0
1,1-Dichloropropene	SW8260	NE	1.0
1,2,3-Trichlorobenzene	SW8260	NE	5.0
1,2,3-Trichloropropane	SW8260	140	2.0
1,2,4-Trichlorobenzene	SW8260	NE	5.0
1,2,4-Trimethylbenzene	SW8260	NE	1.0
1,2-Dibromo-3-Chloropropane	SW8260	710	5.0
1,2-Dichlorobenzene	SW8260	NE	1.0
1,2-Dichloroethane	SW8260	11,000	1.0
1,2-Dichloropropane	SW8260	15,000	1.0
1,3,5-Trimethylbenzene	SW8260	NE	1.0
1,3-Dichlorobenzene	SW8260	NE	1.0
1,3-Dichloropropane	SW8260	NE	1.0
1,4-Dichlorobenzene	SW8260	42,000	1.0
2,2-Dichloropropane	SW8260	NE	1.0
2-Chlorotoluene	SW8260	NE	1.0
4-Chlorotoluene	SW8260	NE	1.0
Acrolein	SW8260	NE	1.0
Acrylonitrile	SW8260	1,900	5.0
Benzene	SW8260	30[2]	1.0
Bromobenzene	SW8260	NE	1.0
Bromochloromethane	SW8260	NE	1.0
Bromoform	SW8260	130,000	1.0
Bromomethane	SW8260	NE	1.0
Carbon Tetrachloride	SW8260	7,700	1.0
Chlorobenzene	SW8260	NE	1.0
Chloroethane	SW8260	350,000	1.0
Chloroform	SW8260	160,000	1.0
Chloromethane	SW8260	77,000	1.0
Cis-1,2-Dichloroethene	SW8260	NE	1.0
Cis-1,3-Dichloropropene	SW8260	NE	1.0
Dibromochloromethane	SW8260	12,000	1.0
Dibromomethane	SW8260	NE	1.0
Dichlorobromomethane	SW8260	16,000	1..0
Dichlorodifluoromethane (CFC-12)	SW8260	NE	1.0
Ethylbenzene	SW8260	6000[2]	1.0
Ethylene dibromide	SW8260	5	1.0
Hexachlorobutadiene	SW8260	13,000	5.0
Isopropylbenzene (Cumene)	SW8260	NE	1.0
Methyl t-butyl ether	SW8260	100	1.0
Methylene Chloride	SW8260	20	2.0
Naphthalene	SW8260	50,002	5.0
n-Butylbenzene	SW8260	NE	1.0
n-Propylbenzene	SW8260	NE	1.0
p-Isopropyltoluene	SW8260	NE	1.0
Sec-Butylbenzene	SW8260	NE	1.0
Styrene	SW8260	33,000	1.0
Tert-Butylbenzene	SW8260	NE	1.0
Tetrachloroethene	SW8260	50	1.0
Toluene	SW8260	7000[2]	1.0
Xylenes	SW8260	9000[2]	1.0
Trans-1,2-Dichloroethene	SW8260	NE	1.0
Trans-1,3-Dichloropropene	SW8260	NE	1.0
Trichloroethene	SW8260	30[2]	1.0
Trichlorofluoromethane (CFC-11)	SW8260	NE	1.0
Vinyl Chloride	SW8260	670	1.0

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Semi-volatile Organic Compounds (µg/kg)			
1,2,4-Trichlorobenzene	SW8270	NE	67
1,2-Dichlorobenzene	SW8270	NE	67
1,3-Dichlorobenzene	SW8270	NE	67
1,4-Dichlorobenzene	SW8270	42,000	67
1-Methylnaphthalene	SW8270	NE	67
2,2'-Oxybis[1-chloropropane]	SW8270	14,000	67
2,4,5-Trichlorophenol	SW8270	NE	330
2,4,6-Trichlorophenol	SW8270	91,000	330
2,4-Dichlorophenol	SW8270	NE	330
2,4-Dimethylphenol	SW8270	NE	67
2,4-Dinitrophenol	SW8270	NE	670
2,4-Dinitrotoluene	SW8270	NE	330
2,6-Dinitrotoluene	SW8270	NE	330
2-Chloronaphthalene	SW8270	NE	67
2-Chlorophenol	SW8270	NE	67
2-Methylnaphthalene	SW8270	NE	67
2-Nitroaniline	SW8270	NE	330
2-Nitrophenol	SW8270	NE	67
3,3'-Dichlorobenzidine	SW8270	2,200	330
3-Nitroaniline	SW8270	NE	330
4,6-Dinitro-2-Methylphenol	SW8270	NE	670
4-Bromophenyl phenyl ether	SW8270	NE	67
4-Chloro-3-Methylphenol	SW8270	NE	330
4-Chloroaniline	SW8270	NE	330
4-Chlorophenyl-Phenylether	SW8270	NE	67
4-Nitroaniline	SW8270	NE	330
4-Nitrophenol (p-Nitrophenol)	SW8270	NE	330
Acenaphthene	SW8270	NE	67
Acenaphthylene	SW8270	NE	67
Anthracene	SW8270	NE	67
Benzo(a)anthracene	SW8270	NE	67
Benzo(a)pyrene	SW8270	140	67
Benzo(b)fluoranthene	SW8270	NE	67
Benzo(ghi)perylene	SW8270	NE	67
Benzo(k)fluoranthene	SW8270	NE	67
Benzoic Acid	SW8270	NE	670
Benzyl Alcohol	SW8270	NE	330
Bis(2-Chloroethoxy)Methane	SW8270	NE	67
Bis(2-Chloroethyl)Ether	SW8270	910	67
Bis(2-Ethylhexyl) Phthalate	SW8270	71,000	67
Butyl benzyl phthalate	SW8270	NE	67
Carbazole	SW8270	50,000	67
Chrysene	SW8270	NE	67
Dibenzo(a,h)anthracene	SW8270	NE	67
Dibenzofuran	SW8270	NE	67
Dibutyl phthalate	SW8270	NE	67
Diethyl phthalate	SW8270	NE	67
Dimethyl phthalate	SW8270	NE	67
Di-N-Octyl Phthalate	SW8270	NE	67
Fluoranthene	SW8270	NE	67
Fluorene	SW8270	NE	67
Hexachlorobenzene	SW8270	630	67
Hexachlorobutadiene	SW8270	13,000	67
Hexachlorocyclopentadiene	SW8270	NE	330
Hexachloroethane	SW8270	71,000	67
Indeno(1,2,3-cd)pyrene	SW8270	NE	67
Isophorone	SW8270	1,100,000	67
Naphthalene	SW8270	5,000	67
Nitrobenzene	SW8270	NE	67
N-Nitrosodi-n-propylamine	SW8270	140	67
N-Nitrosodiphenylamine	SW8270	200,000	67
o-Cresol (2-methylphenol)	SW8270	NE	67
p-Cresol (4-methylphenol)	SW8270	NE	67
Pentachlorophenol	SW8270	8,300	330
Phenanthrene	SW8270	NE	67
Phenol	SW8270	NE	67
Pyrene	SW8270	NE	67
PCB Aroclors (mg/kg)			
PCB-aroclor 1016	SW8082B	NE	0.033
PCB-aroclor 1221	SW8082B	NE	0.033
PCB-aroclor 1232	SW8082B	NE	0.033
PCB-aroclor 1242	SW8082B	NE	0.033
PCB-aroclor 1248	SW8082B	NE	0.033
PCB-aroclor 1254	SW8082B	NE	0.033
PCB-aroclor 1260	SW8082B	NE	0.033
Total PCBs	SW8082B	1	0.033
Pesticides (µg/kg)			
4,4'-DDD	SW8081A	4,200	3.3
4,4'-DDE	SW8081A	2,900	3.3
4,4'-DDT	SW8081A	2,900	3.3
Aldrin	SW8081A	59	1.7
Alpha-BHC	SW8081A	160	1.7
alpha-Chlordane	SW8081A	NE	1.7
Beta-BHC	SW8081A	560	1.7
Delta-BHC	SW8081A	NE	1.7
Dieldrin	SW8081A	63	3.3

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Endosulfan I	SW8081A	NE	1.7
Endosulfan II	SW8081A	NE	3.3
Endosulfan Sulfate	SW8081A	NE	3.3
Endrin	SW8081A	NE	3.3
Endrin Aldehyde	SW8081A	NE	3.3
Endrin Ketone	SW8081A	NE	3.3
Heptachlor	SW8081A	220	1.7
Heptachlor Epoxide	SW8081A	110	1.7
Lindane	SW8081A	10	1.7
Methoxychlor	SW8081A	NE	17.0
Toxaphene	SW8081A	910	170.0
trans-Chlordane	SW8081A	NE	1.7

Notes:

[1] Model Toxics Control Act (MTCA) Method B soil cleanup levels as well as Method A cleanup levels where noted (Chapter 173-340 WAC).

[2] MTCA Method A soil cleanup level.

[3] 30 mg/kg if benzene is present; 100 mg/kg if benzene is not present

µg/kg = Microgram per kilogram

mg/kg = Milligram per kilogram

NE = Not established

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Table 3

Methods of Analysis and Target Reporting Limits for Limits of Soil Excavation Verification Soil Samples

American Plating Site Remediation Project

Tacoma, Washington

Analyte	Analytical Method	Target Reporting Limit[1]	Laboratory Reporting Limit
Total Metals (mg/kg)			
Cadmium	6010 - ICP-OES	2	0.5
Chromium	6010 - ICP-OES	2,000	0.2
TCLP Metals (mg/L)			
Cadmium	6010 - ICP-OES	1	0.05
Chromium	6010 - ICP-OES	5	0.02

Notes:

[1] Model Toxics Control Act Method B soil cleanup levels (Chapter 173-340 WAC) for total metals and Toxicity Characteristic criteria (Chapter 173-303 WAC) for TCLP metals.

TCLP = Toxicity Characteristic Leaching Procedure

mg/kg = Milligram per kilogram

mg/L = Milligram per liter

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Table 4

Methods of Analysis and Target Reporting Limits for Stockpile Characterization for Disposal Soil Samples

American Plating Site Remediation Project
Tacoma, Washington

Analyte	Analytical Method	Target Reporting Limit[1]	Laboratory Reporting Limit
Total Metals (mg/kg)			
Arsenic	6010 - ICP-OES	100	5.0
Barium	6010 - ICP-OES	2,000	0.3
Cadmium	6010 - ICP-OES	20	0.2
Chromium	6010 - ICP-OES	100	0.5
Hexavalent Chromium	6010 - ICP-OES	19	0.1
Lead	6010 - ICP-OES	100	2
Mercury	7471-CVA	2	0.025
Selenium	6010 - ICP-OES	20	5
Silver	6010 - ICP-OES	100	0.3
TCLP Metals (mg/L)			
Arsenic	6010 - ICP-OES	5	0.25
Barium	6010 - ICP-OES	100	0.015
Cadmium	6010 - ICP-OES	1	0.01
Chromium	6010 - ICP-OES	5	0.025
Lead	6010 - ICP-OES	5	0.1
Mercury	7471-CVA	0.2	0.0005
Selenium	6010 - ICP-OES	1	0.25
Silver	6010 - ICP-OES	5	0.015
Petroleum Hydrocarbons (mg/kg)			
Gasoline-range Petroleum Hydrocarbons	NWTPH-G	30/100[4]	5.0
Diesel- and Oil-range Petroleum Hydrocarbons	NWTPH-Dx	2000	5.0
Volatile Organic Compounds (µg/kg)			
1,1,1,2-Tetrachloroethane	SW8260B	38,000	1.0
1,1,1-Trichloroethane	SW8260B	2,000	1.0
1,1,2,2-Tetrachloroethane	SW8260B	5,000	1.0
1,1,2-Trichloroethane	SW8260B	18,000	1.0
1,1-Dichloroethane	SW8260B	NE	1.0
1,1-Dichloroethene	SW8260B	NE	1.0
1,1-Dichloropropene	SW8260B	NE	1.0
1,2,3-Trichlorobenzene	SW8260B	NE	5.0
1,2,3-Trichloropropane	SW8260B	140	2.0
1,2,4-Trichlorobenzene	SW8260B	NE	5.0
1,2,4-Trimethylbenzene	SW8260B	NE	1.0
1,2-Dibromo-3-Chloropropane	SW8260B	710	5.0
1,2-Dichlorobenzene	SW8260B	NE	1.0
1,2-Dichloroethane	SW8260B	11,000	1.0
1,2-Dichloropropane	SW8260B	15,000	1.0
1,3,5-Trimethylbenzene	SW8260B	NE	1.0
1,3-Dichlorobenzene	SW8260B	NE	1.0
1,3-Dichloropropane	SW8260B	NE	1.0
1,4-Dichlorobenzene	SW8260B	42,000	1.0
2,2-Dichloropropane	SW8260B	NE	1.0
2-Chlorotoluene	SW8260B	NE	1.0
4-Chlorotoluene	SW8260B	NE	1.0
Acrolein	SW8260B	NE	1.0
Acrylonitrile	SW8260B	1,900	5.0
Benzene	SW8260B	30	1.0
Bromobenzene	SW8260B	NE	1.0
Bromochloromethane	SW8260B	NE	1.0
Bromoform	SW8260B	130,000	1.0
Bromomethane	SW8260B	NE	1.0
Carbon Tetrachloride	SW8260B	7,700	1.0
Chlorobenzene	SW8260B	NE	1.0
Chloroethane	SW8260B	350,000	1.0
Chloroform	SW8260B	160,000	1.0
Chloromethane	SW8260B	77,000	1.0
Cis-1,2-Dichloroethene	SW8260B	NE	1.0
Cis-1,3-Dichloropropene	SW8260B	NE	1.0
Dibromochloromethane	SW8260B	12,000	1.0
Dibromomethane	SW8260B	NE	1.0
Dichlorobromomethane	SW8260B	16,000	1.0
Dichlorodifluoromethane (CFC-12)	SW8260B	NE	1.0
Ethylbenzene	SW8260B	6,000	1.0

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Ethylene dibromide	SW8260B	5	1.0
Hexachlorobutadiene	SW8260B	13,000	5.0
Isopropylbenzene (Cumene)	SW8260B	NE	1.0
Methyl t-butyl ether	SW8260B	100	1.0
Methylene Chloride	SW8260B	20	2.0
Naphthalene	SW8260B	5,000	5.0
n-Butylbenzene	SW8260B	NE	1.0
n-Propylbenzene	SW8260B	NE	1.0
p-Isopropyltoluene	SW8260B	NE	1.0
Sec-Butylbenzene	SW8260B	NE	1.0
Styrene	SW8260B	33,000	1.0
Tert-Butylbenzene	SW8260B	NE	1.0
Tetrachloroethene	SW8260B	50	1.0
Toluene	SW8260B	7,000	1.0
Xylenes	SW8260B	9,000	1.0
Trans-1,2-Dichloroethene	SW8260B	NE	1.0
Trans-1,3-Dichloropropene	SW8260B	NE	1.0
Trichloroethene	SW8260B	30	1.0
Trichlorofluoromethane (CFC-11)	SW8260B	NE	1.0
Vinyl Chloride	SW8260B	670	1.0

Notes:

[1] Criteria presented include concentrations equivalent to 20 times the Toxicity Characteristic criteria (i.e., 20 time rule values) for total metals, the Toxicity Characteristic criteria for TCLP metals, and Model Toxics Control Act Method B and Method A soil cleanup levels for petroleum hydrocarbons and volatile organic compounds.

µg/kg = Microgram per kilogram

(mg/L) = Milligram per liter

mg/kg = Milligram per kilogram

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Table 5

Methods of Analysis and Target Reporting Limits for Water Characterization Prior to Disposal Samples

American Plating Site Remediation Project

Tacoma, Washington

Analyte	Analytical Method	Target Reporting Limit[1]	Laboratory Reporting Limit
Total Metals (mg/L)			
Cadmium	6010-ICP-OES	0.25	0.002
Chromium	6010-ICP-OES	1	0.005
Hexavalent Chromium	SM 3500-Cr D	0.25	0.01
Copper	6010 - ICP-OES	1	0.002
Lead	6010-ICP-OES	0.4	0.02
Nickel	6010 - ICP-OES	1	0.01
Petroleum Hydrocarbons (mg/L)			
Gasoline-range Petroleum Hydrocarbons	NWTPH-G	50	0.25
Diesel- and Oil-range Petroleum Hydrocarbons	NWTPH-Dx	50	0.1
Inorganics (mg/L)			
Total Cyanide	SM4500 CN I	0.64	0.005

Notes:

[1] Special Approved Discharge to the City of Tacoma Sanitary Sewer criteria (City of Tacoma, 2011).

µg/L = Microgram per liter

mg/L = Milligram per liter

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Table 6

Methods of Analysis and Target Reporting Limits for Groundwater Compliance Monitoring Samples

American Plating Site Remediation Project

Tacoma, Washington

Analyte	Analytical Method	Target Reporting Limit[1]	Laboratory Reporting Limit
Dissolved Metals (µg/L)			
Cadmium	200.8 - ICPMS	9.3	0.1
Chromium	200.8 - ICPMS	-	0.5
Hexavalent Chromium	SM 3500-Cr D	50	10
Copper	200.8 - ICPMS	3.1	0.5
Nickel	200.8 - ICPMS	8.2	0.5
Inorganics (mg/L)			
WAD Cyanide	SM4500 CN I	0.001	0.005

Notes:

[1] Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC) Marine Chronic criteria.

µg/L = Microgram per liter

mg/L = milligram per liter

- = No criteria has been established for the identified analyte.

DRAFT

Table 7

Test Methods, Sample Containers, Preservation and Holding Times

American Plating Site Remediation Project
Tacoma, Washington

	Soil					Water				
Analysis	**Method**	**Minimum Sample Size**	**Sample Containers**	**Sample Preservation**	**Holding Times**	**Method**	**Minimum Sample Size**	**Sample Containers**	**Sample Preservation**	**Holding Times**
Total/Dissolved Metals	EPA 6010-OES 7471A	50 g	8 oz glass wide-mouth with Teflon-lined lid	Cool ≤6°C	6 months	EPA 6010-OES 7470A	200 mL	500 mL HDPE	Cool ≤6°C pH<2 with 1:1 HNO3	6 months
TCLP Metals	EPA 6010-OES 7470A	50 g	8 oz glass wide-mouth with Teflon-lined lid	Cool ≤6°C	6 months	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Total and WAD Cyanide	SM 4500-CN 1	25 g	4 oz glass wide-mouth with Teflon-lined lid	Cool ≤6°C	14 days	SM 4500-CN 1	200 mL	500 mL HDPE	Cool ≤6°C pH >12 with NaOH if sulfides not present	14 days if preserved, 48 hours if not
Volatile Organic Compounds	EPA 8260 PT-GC/MS	5 g	Three 40 mL glass vials with septa, 2 oz glass wide-mouth with septa	Cool ≤6°C two vials Na2S2O4, one MeOH	14 days	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Semi-Volatile Organic Compounds	EPA 8207D	50 g	8 oz glass wide-mouth with Teflon-lined lid	Cool ≤6°C	14 days to extract 40 days to analysis	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Gasoline-Range Petroleum Hydrocarbons	NWTPH-G	25 g	Two 40 mL glass vials with septa, 2 oz glass wide-mouth with septa	Cool ≤6°C MeOH	14 days	NWTPH-G	40 mL	Three 40-ml VOC vials	Cool ≤6°C HCl to pH <2	14 days
Diesel- and Oil-Range Petroleum Hydrocarbons	NWTPH-Dx	25 g	8 oz glass wide-mouth with Teflon-lined lid	Cool ≤6°C	14 days to extract 40 days to analysis	NWTPH-Dx	500 mL	Two 500-mL amber glass	Cool ≤6°C	7 days to extract 40 days to analysis
PCBs	EPA 8082B	25 g	8 oz glass wide-mouth with Teflon-lined lid	Cool ≤6°C	14 days to extract 40 days to analysis	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Pesticides	EPA 8081A	25 g	8 oz glass wide-mouth with Teflon-lined lid	Cool ≤6°C	14 days to extract 40 days to analysis	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

DRAFT

Notes:

Holding Times are based on elapsed time from date of collection.
TCLP = Toxicity Characteristic Leaching Procedure
PCBs = Polychlorinated biphenyls
oz = ounce
mL = milliliter
g = gram
Na2S2O4 = Sodium bisulfate
MeOH = Methanol
HNO3 = Nitric Acid
NaOH = Sodium Hydroxide

Table 8

Quality Control Samples - Type and Frequency

American Plating Site Remediation Project
Tacoma, Washington

Chemical Analysis	Field QC		Laboratory QC				
	Field Duplicates	Trip Blanks	Method Blanks	LCS	Matrix Spike	Matrix Spike Duplicate	Duplicate
Soil							
Total Metals	1 per every 10 samples	NA	One per batch	One per batch	One per batch	NA	One per batch
TCLP Metals	1 per every 10 samples	NA	One per batch	NA	One per batch	NA	NA
Total and WAD Cyanide	1 per every 10 samples	NA	One per batch	One per batch	One per batch	NA	One per batch
Volatile Organic Compounds	1 per every 10 samples	One per cooler containing VOC samples	One per batch	One per batch	One per batch	One per batch	NA
Semi-Volatile Organic Compounds	1 per every 10 samples	NA	One per batch	One per batch	One per batch	One per batch	NA
Gasoline-Range Petroleum Hydrocarbons	1 per every 10 samples	NA	One per batch	One per batch	One per batch	One per batch	NA
Diesel- and Oil-Range Petroleum Hydrocarbons	1 per every 10 samples	NA	One per batch	One per batch	One per batch	One per batch	NA
PCBs	1 per every 10 samples	NA	One per batch	One per batch	One per batch	One per batch	NA
Pesticides	1 per every 10 samples	NA	One per batch	One per batch	One per batch	One per batch	NA
Water							
Total and Dissolved Metals	1 per groundwater compliance monitoring sampling event	NA	One per batch	One per batch	One per batch	NA	One per batch
Hexavalent Chromium	1 per groundwater compliance monitoring sampling event	NA	One per batch	One per batch	One per batch	NA	One per batch
Total, Free, and WAD Cyanide	1 per groundwater compliance monitoring sampling event	NA	One per batch	One per batch	One per batch	NA	One per batch
Gasoline-Range Petroleum Hydrocarbons	1 per groundwater compliance monitoring sampling event	NA	One per batch	One per batch	One per batch	One per batch	NA
Diesel- and Oil-Range Petroleum Hydrocarbons	1 per groundwater compliance monitoring sampling event	NA	One per batch	One per batch	One per batch	One per batch	NA

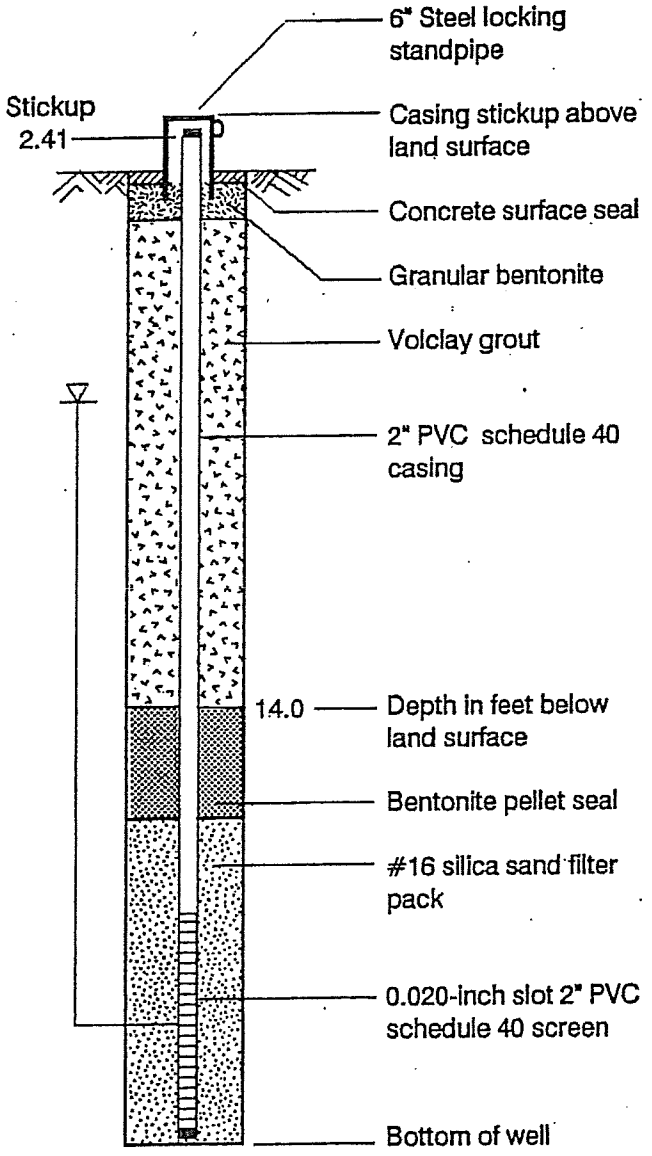
Notes:

An analytical batch is defined as a group of samples taken through a preparation procedure and sharing a method blank, LCS, and MS/MSD (or MS and lab duplicate).
No more than 20 field samples can be contained in one batch.
QC = Quality control
LCS = Laboratory control sample
MS = Matrix spike sample
MSD = Matrix spike duplicate sample
NA = Not Applicable

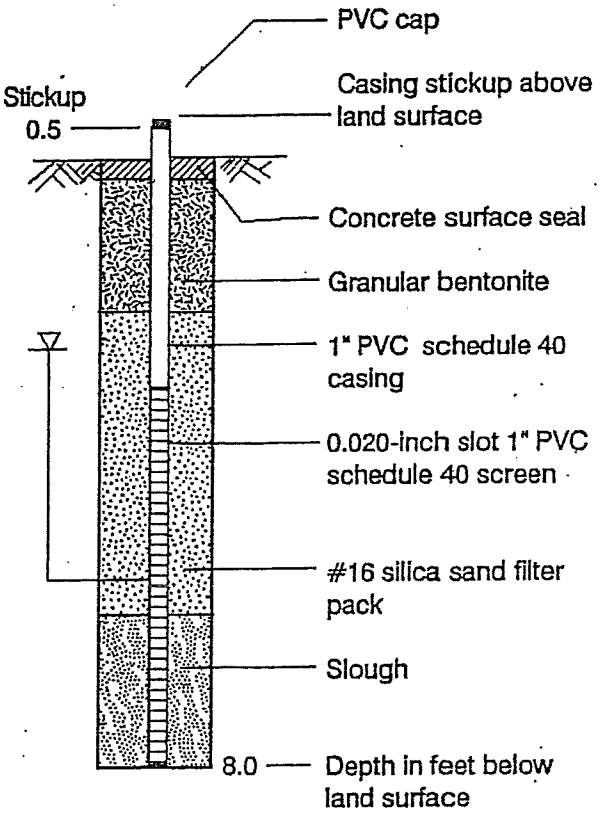
DRAFT

ATTACHMENT 5
Existing Monitoring Well Logs

Monitoring Well Installation



Piezometer Installation



Note:

* Groundwater elevations shown were measured on 7/11/88.
* Elevation datum: Temporary bench mark is the Northeast corner of Building No. 2 with the assumed elevation of 15.0' MLLW.
* See Table 6-1 for top of casing elevations.
* OVA = Organic Vapor Analyzer

PLATE **B2**

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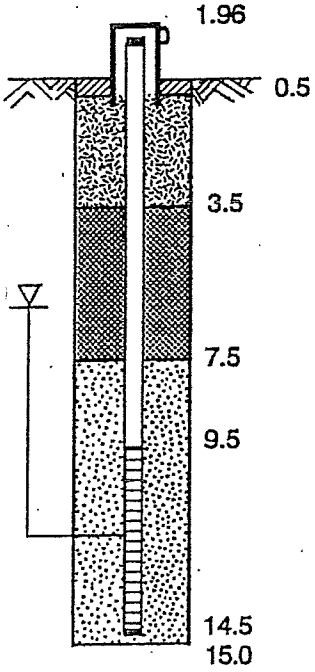
Monitoring Well Legend - Phase I

American Plating, Inc.
Tacoma, Washington

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.001	NB	RJS	3 May 89		

Equipment Mobile B-61

Land Surface Elevation 17.13 feet MLLW Date 5-11-88



Depth in Feet	Sample	OVA (ppm)	Blows/Foot
0			
		>1000	7
5		>1000	<1
		0	6
10		900	2
15			
20			
25			
30			
35			
40			

BLACK SILTY GRAVEL (GM) loose, moist; with some sand, abundant organics, appears slightly oily.

BROWN SILTY MEDIUM SAND (SM) loose, moist; with trace organics.

BROWN SANDY SILT (ML) very soft, saturated; with abundant wood fragments, occasional gravel, and sand interlayers that are approximately 1 inch thick.

Boring terminated at 15 feet on 5/11/88.

Groundwater encountered at approximately 7 feet.

*Water levels indicated are for 7-11-88. (See Table 7-2)

FIGURE B3

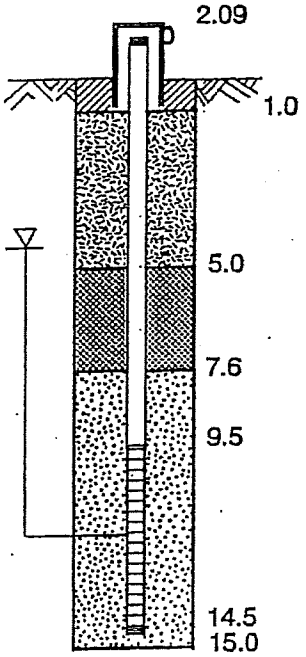
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Log of Boring MW-1

American Plating Inc.
Tacoma, Washington

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.001	NB	JAJ	27 May 88		

Well Installation Summary



Depth in Feet	Sample	OVA (ppm)	Blows/Foot
0			
		800	5
5			
		>1000	6
			2
10			<1
			<1
15			
20			
25			
30			
35			
40			

Equipment Mobile B-61

Land Surface Elevation 14.81 feet MLLW Date 5-12-88

BROWN SILTY GRAVEL (GM) dense, dry; with some sand, occasional wood fragments.

Becomes loose, moist with abundant wood fragments at approximately 1 foot.

Wood chips with some silt at 2.3 to 2.8 feet.

GRAY SILTY SAND (SM) loose, moist; with trace organics, medium grained sand.

GRAY AND DARK GRAY SANDY SILT (ML) very soft, saturated; with organics and an H_2S odor, trace to some clay, fine grained sand.

GRAY CLAYEY SILT (ML) very soft, saturated; with trace wood fragments.

GRAY SILTY SAND (SM) loose, wet; medium grained sand.

Boring terminated at 15 feet on 5/12/88.

Groundwater encountered at approximately 3.5 feet.

*Water levels indicated are for 7-11-88. (See Table 7-2)

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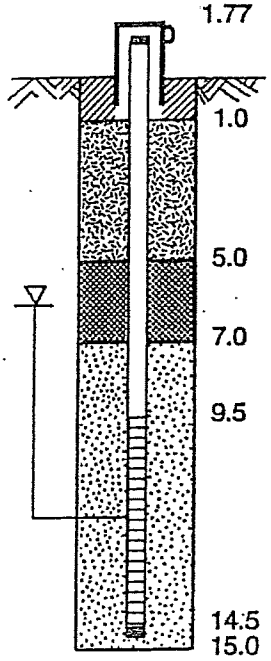
Log of Boring MW-2

American Plating Inc.
Tacoma, Washington

FIGURE
B4

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.001	NB	JAZ	27 May 88		

Well Installation Summary



OVA (ppm)

Blows/Foot

Depth in Feet

Sample

Equipment Mobile B-61

Land Surface Elevation 14.64 feet MLLW Date 5/11/88

Depth in Feet	Blows/Foot	Sample	Description
0			
	6		BROWN SILTY GRAVEL (GM) loose, moist to wet; with some sand and occasional wood fragments.
5	4		Wood layer encountered from approximately 3.3 to 3.8 feet.
			BROWN SILTY SAND (SM) very loose, wet to saturated; contains wood fragments.
	2		
10	<1		DARK BROWN TO GRAY CLAYEY SILT (ML) very soft to soft, saturated; with abundant wood fragments.
	<1		DARK GRAY SILT (ML) very soft, saturated; with some shells, and trace fine-grained sand.
15			Boring terminated at 15 feet on 5/11/88.
20			*Water levels indicated are for 7-11-88. (See Table 7-2)
25			
30			
35			
40			

FIGURE

B5

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Log of Boring MW-3

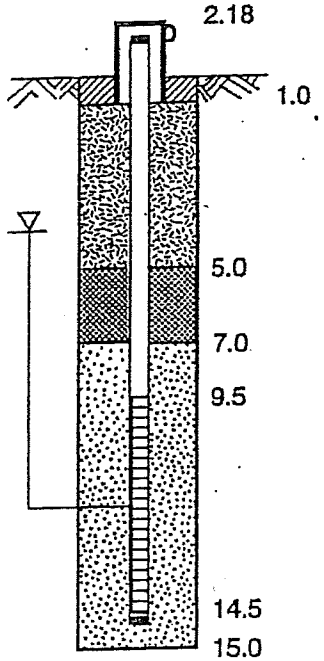
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Tacoma, Washington

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.001	NB	JAS	27 May 88		

Equipment Mobile B-61

Land Surface Elevation 14.41 feet MLLW Date 5/11/88

Well Installation Summary



OVA (ppm)	Blows/Foot	Sample	Depth in Feet	
	3		0	BROWN SILTY SAND (SM) very loose, moist to wet; occasional gravel and wood fragments.
	12		5	DARK GRAY TO BLACK SILTY GRAVEL (GM) loose to dense, saturated; with some sand, contains fine gravel and wood fragments.
	5		15	DARK GRAY SILTY SAND (SM) loose, saturated; with occasional wood fragments and interbeds of fine sand.
			20	Boring terminated at 15 feet on 5/11/88.
				Groundwater encountered at approximatgely 3 feet.
				*Water levels indicated are for 7-11-88. (See Table 7-2)
			25	
			30	
			35	
			40	

FIGURE

B6

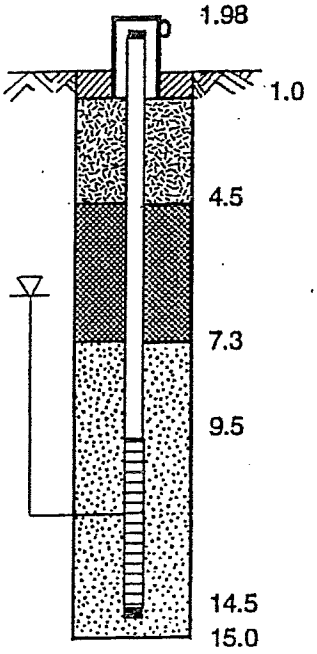
Applied Geotechnology Inc.
Geological Engineering
Geology & Hydrogeology

Log of Boring MW-4

American Plating Inc.
Tacoma, Washington

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.001	NB	JAJ	27 May 88		

Well Installation Summary



OVA (ppm)	Blows/Foot
40	6
200	<2
30	<1
	<1
	4

Depth in Feet / Sample

Equipment Mobile B-61

Land Surface Elevation 14.63 feet MLLW Date 5/12/88

0 — BROWN SILTY SAND (SM) loose, moist; with some wood fragments, occasional gravels, abundant roots in upper 2.5 feet, medium grained sand.

Grades to a fine sand at approximately 3.0 feet.

5 — GRAY-BROWN SILT (ML) very soft, moist to saturated; with occasional organic nodules, and trace clay and fine sand.

10 — Becomes slightly sandier at approximately 11 feet.

15 — Boring terminated at 15 feet on 5/12/88.

Groundwater encountered at approximately 3 feet.

*Water levels indicated are for 7-11-88. (See Table 7-2)

20

25

30

35

40

FIGURE

B7

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Geological Engineering
Geology & Hydrogeology

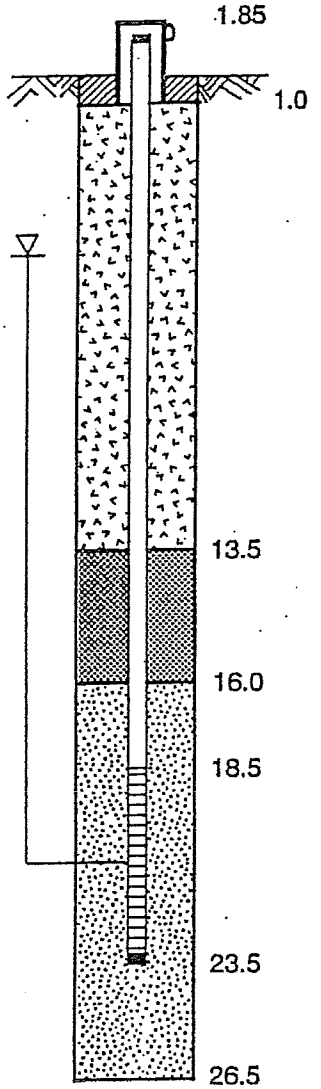
Log of Boring MW-5

American Plating Inc.
Tacoma, Washington

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.001	NB	GAJ	27 May 88		

Equipment Bucyrus 22-W Cable Tool

Land Surface Elevation 14.47 feet MLLW Date 5/5/88



OVA (ppm)	Blows/Foot	Depth In Feet	Sample
		0	
4	33	5	
	13	10	
110	7	15	
		20	
		25	
		30	
		35	
		40	

BROWN SILTY SAND (SM) medium dense, moist; with some organics and gravel (Fill).

DARK GRAY TO BLACK SANDY GRAVEL (GW) dense, saturated; with some silt (Fill).

BLACK SILTY SAND (SM) medium dense, saturated; with some gravel.

Becomes gray.

GRAY SILTY SAND (SM) medium dense, saturated; with some gravel and organics.

GRAY SANDY GRAVEL (GW) medium dense, saturated with some silt.

Minor methane explosion at approximately 18 feet during weld.

GRAY SILTY GRAVEL (GM) dense, saturated; with some sand (Till).

Boring terminated at approximately 26.5 feet on 5/5/88.

Groundwater encountered at approximately 8 feet .

*Water levels indicated are for 7-11-88. (See Table 7-2)

FIGURE

B9

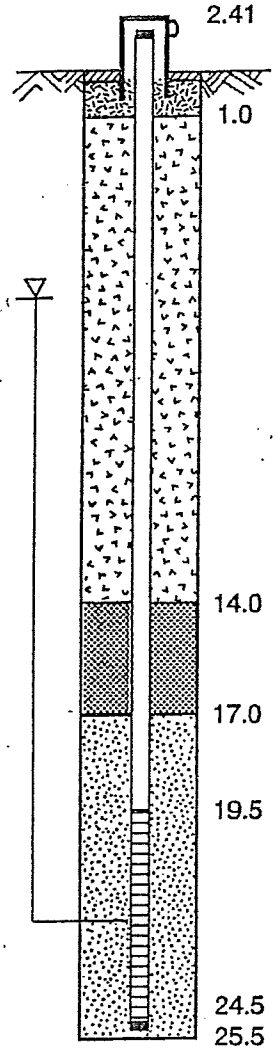
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Geology & Hydrogeology

Log of Boring MW-7

American Plating Inc.
Tacoma, Washington

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.001	NB	JAS	27 May 88		

Well Installation Summary



OVA (ppm)	Blows/Foot	Depth in Feet	Sample
	2	0	
	7	5	
	12	10	
	7	15	
	8	20	
	50/4"	25	
		30	
		35	
		40	

Equipment Bucyrus 22-W Cable Tool

Land Surface Elevation 14.83 feet MLLW Date 5/5/88

GRAY-BROWN SILTY SAND (SM) medium dense, moist; with some gravel (Fill).

GRAY SILT (ML) soft, saturated; with trace gravel and sand with interbeds of SILTY GRAVEL, loose, saturated; with trace sand.

BLACK SANDY SILT (ML) medium stiff, saturated; with trace shells and wood fragments.

Grades to clayey silt, saturated, with some sand and organics (shells).

DARK GRAY SILTY SAND (SM) medium dense, saturated; with some gravel and organics.

Grades to SAND (SP) with some silt, interlayered with sandy silt and silty sand.

Boring terminated at approximately 25.5 feet on 5/4/88.

Groundwater encountered at approximately 8.5 feet on 5/5/88.

*Water levels indicated are for 7-11-88. (See Table 7-2)

FIGUR

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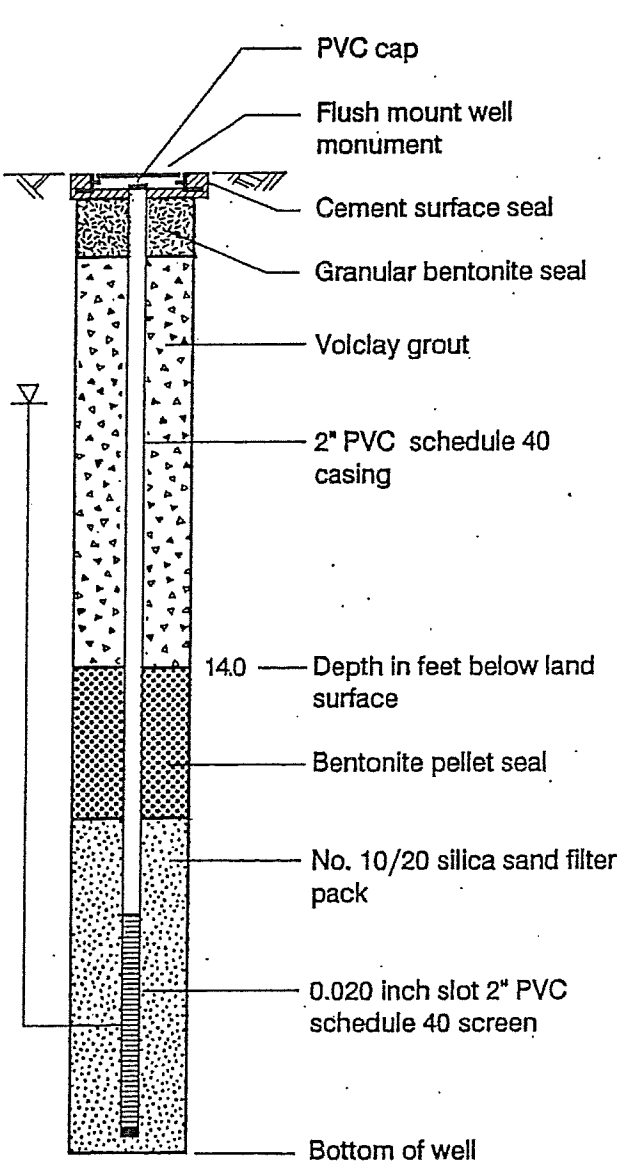
Log of Boring MW-9

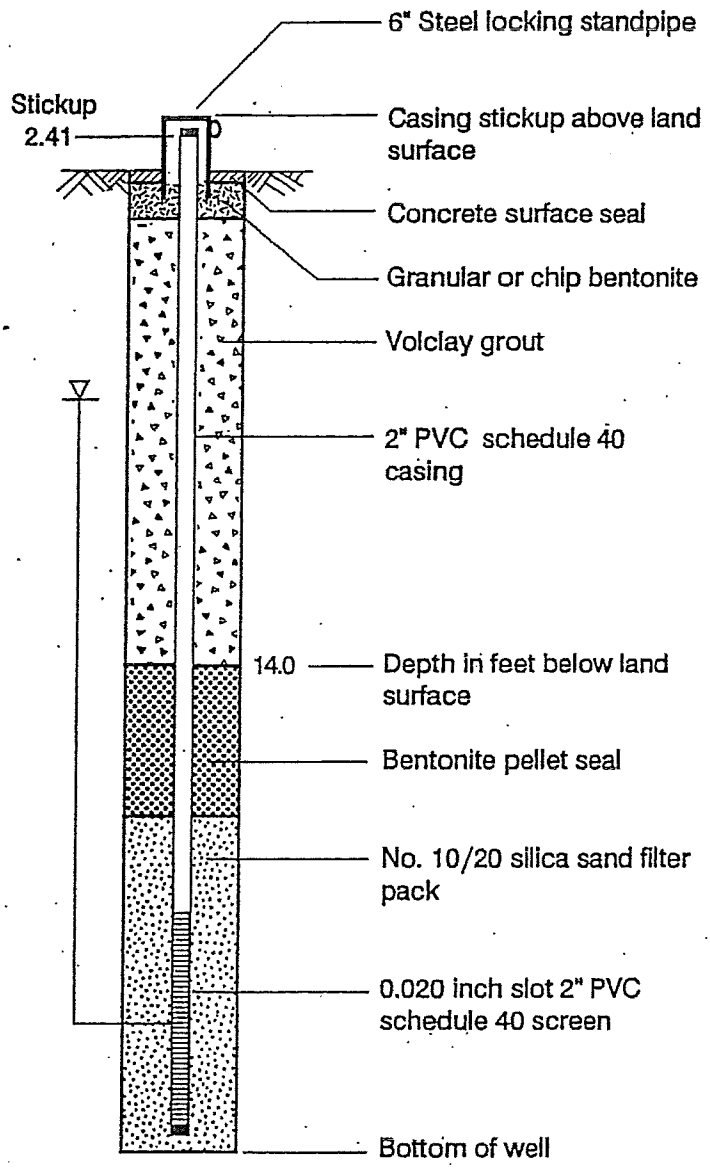
American Plating Inc.
Tacoma, Washington

B11

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.001	NB	JAJ	27 May 88		

Monitoring Well Installation





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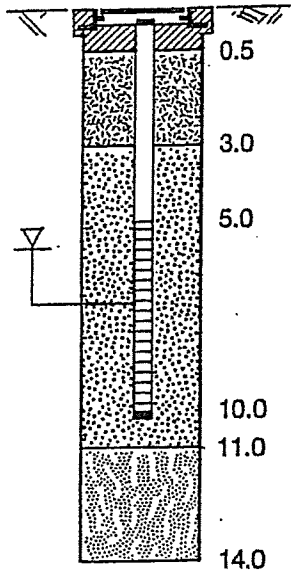
Monitoring Well Legend - Phase II

American Plating, Inc.
Tacoma, Washington

FIGURE
B28

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.004	NB	RJS	3 May 89		

Well Installation Summary



Blows per Foot

Depth in Feet

Sample

Equipment Mobile B-61

Land Surface Elevation 17.17 ft. MLLW Date 3/15/89

Depth in Feet	Sample	Blows per Foot	
0			Asphalt.
		21	BROWN SANDY GRAVEL (GM) medium dense, moist; fine gravel, fine to medium sand, trace clay.
5		17	BROWN-GRAY CLAYEY GRAVEL (GC) medium dense, moist; some sand and wood chips.
		3	BROWN SILT (ML) soft, saturated; some wood chips.
10		1	WOOD, BARK, SAWDUST.
			GRAY SILTY SAND (SM) medium dense, saturated; fine to medium grained, some wood chips, trace clay.
15			Becomes loose at approximately 8 feet.
		4	GRAY TO BLACK MOTTLED SANDY SILT (ML) very soft, saturated; fine to medium sand, trace organics.
20			Becomes sandier at approximately 13 feet.
			Boring terminated 14 feet on 3/15/89.
25			Groundwater encountered at approximately 4 feet.
			* Water level indicated is for 3/30/89.
30			
35			
40			

FIGURE

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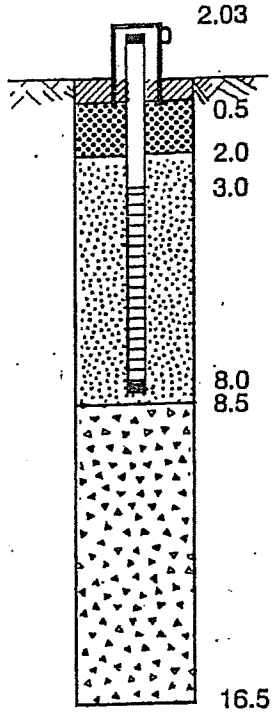
Log of Boring MW-10

American Plating Inc.
Tacoma, Washington

B29

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.004	NB	RSS	11 April 89		

Well Installation Summary



Blows per Foo

Depth in Feet

Sample

Equipment Mobile B-61

Land Surface Elevation 15.63 ft. MLLW Date 3/14/89

Depth	Blows	Description
0		BROWN SILTY SAND (SM) medium dense, wet; medium grained, trace gravel and organics.
	10	GRAY SILTY CLAY (CL) soft, saturated; trace organics.
5	11	GRAY SAND (SP) medium dense, saturated; medium grained, some organics, trace silt, occasional silty zones.
	2	GRAY CLAYEY SILT (ML) very soft, saturated; trace shell fragments and organics.
10	2	
	6	DARK GRAY SILTY SAND (SM) loose, saturated; some wood chips and shell fragments.
15	3	
		Boring terminated at 16.5 feet on 3/14/89.
		Groundwater encountered at approximately 2 feet.
20		
25		
30		
35		
40		

FIGURE

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Log of Boring MW-12

American Plating Inc.
Tacoma, Washington

B31

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,263.004	NB	RJS	11 April 89		

ATTACHMENT 6
Preliminary Landfill Use Authorizations

REPUBLIC SERVICES SPECIAL WASTE PROFILE

Requested Disposal Facility: 4178 Roosevelt Regional MSW LF WA

Waste Profile #
Sales Rep #:

Saveable fill-in form. Restricted printing until all required (yellow) fields are completed.

I. Generator Information

Generator Name: Foss Waterway Development Authority (FWDA)			
Generator Site Address: 2110 East D Street			
City: Tacoma	County: Pierce	State: Washington	Zip: 98402
State ID/Reg No:	State Approval/Waste Code: (if applicable)		NAICS # :
Generator Mailing Address (if different): ☑ 535 East Dock Street			
City: Tacoma	County: Pierce	State: Washington	Zip: 98402
Generator Contact Name: Su Dowie		Email: sdowie@theafoss.com	
Phone Number: (253) 597-8122	Ext:	Fax Number: (253) 597-8129	

IIa. Transporter Information

Transporter Name: To be determined (TBD)		Contact Name:	
Transporter Address:			
City:	County:	State:	Zip:
Phone:	Fax:	State Transportation Number:	

IIb. Billing Information

Bill To: To be determined (TBD)		Contact Name:	
Billing Address:		Email:	
City:	State:	Zip:	Phone:

III. Waste Stream Information

Name of Waste: Metals-contaminated soil and fill (fill includes soil, concrete and wood debris)	
Process Generating Waste: Remedial actions at 2110 East D Street (Site). Past Site use includes previous filling and former light industrial activities (metal plating operations). Remedial actions include excavation of metals-contaminated soil and fill.	
Type of Waste:	☐ INDUSTRIAL PROCESS WASTE ☑ POLLUTION CONTROL WASTE
Physical State:	☑ SOLID ☐ SEMI-SOLID ☐ POWDER ☐ LIQUID
Method of Shipment:	☑ BULK ☐ DRUM ☐ BAGGED ☐ OTHER:
Estimated Annual Volume:	500 Tons
Frequency:	☑ ONE TIME ☐ ANNUAL
Disposal Consideration:	☑ LANDFILL ☐ SOLIDIFICATION ☐ BIOREMEDIATION

IV. Representative Sample Certification

☐ NO SAMPLE TAKEN

Is the representative sample collected to prepare this profile and laboratory analysis, collected in accordance with U.S. EPA 40 CFR 261.20(c) guidelines or equivalent rules?	☑ YES or ☐ NO
Sample Date: Chemical analy	Type of Sample: ☑ COMPOSITE SAMPLE ☐ GRAB SAMPLE
Sample ID Numbers: Chemical analytical data will be provided after stockpile sampling and analysis.	

© Republic Services, Dec 2009

Waste Profile #

V. Physical Characteristics of Waste

Characteristic Components	% by Weight (range)
1. Metals-contaminated soil/fill	70.000
2. Concrete and wood debris	30.000
3.	
4.	
5.	

Color	Odor (describe)	Does Waste Contain Free Liquids?	% Solids	pH:	Flash Point
Brown	None	☐ YES or ☑ NO	100.00	N/A	N/A °F

Attach Laboratory Analytical Report (and/or Material Safety Data Sheet) Including Chain of Custody and Required Parameters Provided for this Profile

Does this waste or generating process contain regulated concentrations of the following Pesticides and/or Herbicides: Chlordane, Endrin, Heptachlor (and it epoxides), Lindane, Methoxychlor, Toxaphene, 2,4-D, or 2,4,5-TP Silvex as defined in 40 CFR 261.33?	☐ Yes or ☑ No
Does this waste contain reactive sulfides (greater than 500 ppm) or reactive cyanide (greater than 250 ppm)[reference 40 CFR 261.23(a)(5)]?	☐ Yes or ☑ No
Does this waste contain regulated concentrations of Polychlorinated Biphenyls (PCBs) as defined in 40 CFR Part 761?	☐ Yes or ☑ No
Does this waste contain concentrations of listed hazardous wastes defined in 40 CFR 261.31, 261.32, 261.33, including RCRA F-Listed Solvents?	☐ Yes or ☑ No
Does this waste exhibit a Hazardous Characteristic as defined by Federal and/or State regulations?	☐ Yes or ☑ No
Does this waste contain regulated concentrations of 2,3,7,8-Tetrachlorodibenzodioxin (2,3,7,8-TCCD), or any other dioxin as defined in 40 CFR 261.31?	☐ Yes or ☑ No
Is this a regulated Radioactive Waste as defined by Federal and/or State regulations?	☐ Yes or ☑ No
Is this a regulated Medical or Infectious Waste as defined by Federal and/or State regulations?	☐ Yes or ☑ No
Is this waste a reactive or heat generating waste?	☐ Yes or ☑ No
Does the waste contain sulfur or sulfur by-products?	☐ Yes or ☑ No
Is this waste generated at a Federal Superfund Clean Up Site?	☐ Yes or ☑ No
Is this waste from a TSD facility, TSD like facility or consolidator?	☐ Yes or ☑ No

VI. Certification

I hereby certify that to the best of my knowledge and belief, the information contained herein is a true, complete and accurate description of the waste material being offered for disposal and all known or suspected hazards have been disclosed. All Analytical Results/Material Safety Data Sheets submitted are truthful and complete and are representative of the waste.

I further certify that by utilizing this profile, neither myself nor any other employee of the company will deliver for disposal or attempt to deliver for disposal any waste which is classified as toxic waste, hazardous waste or infectious waste, or any other waste material this facility is prohibited from accepting by law. I shall immediately give written notice of any change or condition pertaining to the waste not provided herein. Our company hereby agrees to fully indemnify this disposal facility against any damages resulting from this certification being inaccurate or untrue.

I further certify that the company has not altered the form or content of this profile sheet as provided by Republic Services Inc.

Su Dowie/Interim Executive Director	FWDA
Authorized Representative Name And Title (Type or Print)	Company Name
Authorized Representative Signature	Date

© Republic Services, Dec 2009

Nick Rohrbach

From: Whiteman, Leslie <LWhiteman@republicservices.com>
Sent: Wednesday, November 16, 2011 1:32 PM
To: Nick Rohrbach
Subject: RE:

Perfect!

Leslie Whiteman
Allied Waste (Regional Disposal Company)
54 South Dawson Street
Seattle WA 98134

Office: 206.332.7711
Cell: 206.391.1389
LWhiteman@republicservices.com

From: Nick Rohrbach [mailto:nrohrbach@geoengineers.com]
Sent: Monday, November 14, 2011 1:23 PM
To: Whiteman, Leslie
Subject: RE:

Leslie-

Thanks again for reviewing the draft American Plating project profile I submitted to you a couple weeks ago. Another thing I wanted to verify with you was our planned sampling protocols/analysis for the waste that will be produced during remedial actions. These include:

# of sample protocol: *At least one 3-point composite sample will be collected from each segregated stockpile. If segregated stockpiles exceed 100 yards, an additional 3-point composite sample will be collected for each additional 100 yard interval.*

Parameters for analysis: *The parameters selected for analysis are representative of contaminants associated with previous Site activities and include the following:*

1) Total Resource Conversation and Recovery Act (RCRA) metals by EPA method 6010;
2) Petroleum Hydrocarbons by NWTPH-G and NWTPH-Dx;
3) Volatile Organic Compounds (VOCs) by EPA method 8260B;
4) Total Cyanide by EPA method 4500.

If a sample concentration result for an individual metal is greater than the "20-times rule" (Calculations of TCLP Concentrations from Total Concentrations, EPA, September 21, 1992), follow-up TCLP analysis will be performed. Follow-up TCLP analysis will be performed for the individual metal in the sample that contains the individual metal at a concentration that is greater than the "20-times rule".

Let me know if these protocols seem reasonable for this project. Thanks, Nick

From: Whiteman, Leslie [mailto:LWhiteman@republicservices.com]
Sent: Wednesday, November 02, 2011 11:55 AM
To: Nick Rohrbach
Subject: RE:

Looks fine.

Leslie Whiteman
Allied Waste (Regional Disposal Company)
54 South Dawson Street
Seattle WA 98134

Office: 206.332.7711
Cell: 206.391.1389
LWhiteman@republicservices.com

From: Nick Rohrbach [mailto:nrohrbach@geoengineers.com]
Sent: Wednesday, November 02, 2011 11:21 AM
To: Whiteman, Leslie
Subject: RE:

I'm sorry, Leslie. This task got away from me. Anyway, attached is the draft profile for your review and comment. Let me know if this looks OK to include in our specifications and bid documents.

Nick

From: Whiteman, Leslie [mailto:LWhiteman@republicservices.com]
Sent: Tuesday, November 01, 2011 2:09 PM
To: Nick Rohrbach
Subject:

I did not receive a profile to review from you yet??

Leslie Whiteman
Allied Waste (Regional Disposal Company)
54 South Dawson Street
Seattle WA 98134

Office: 206.332.7711
Cell: 206.391.1389
LWhiteman@republicservices.com

Confidentiality: This message is confidential and intended solely for use of the individual or entity to whom it is addressed. If you are not the person for whom this message is intended, please delete it and notify me immediately, and please do not copy or send this message to anyone else.

WASTE MANAGEMENT

Generator's Hazardous Waste Profile Sheet

Service Agreement on file? ☐ Yes ☐ No Profile Number OR306485

☐ Check here if there are multiple generating locations for this waste. Attach addition locations.

☑ Check here if a Certificate of Destruction or Disposal is required.

Requested Disposal Facility: Chemical Waste Management (Hazardous Waste Facility)

☐ Renewal for Profile Number: _____ Waste Approval Expiration Date: _____

A. Waste Generator Facility Information (must reflect location of waste generation/origin)

1. Generator Name: Foss Waterway Development Authority
2. Site Address: 2110 East D Street
3. City/ZIP: Tacoma, 98402
4. State: WA
5. County: Pierce
6. Contact Name/Title: Su Dowie/Interim Executive Director
7. Email Address: sdowie@theafoss.com
8. Phone: 253-597-8122
9. FAX: 253-597-8129
10. NAICS Code: _____
11. Generator USEPA ID #: _____
12. State ID# (if applicable): WAD083350231

B. Customer Information ☐ same as above

P. O. Number: _____

1. Customer Name: FWDA
2. Billing Address: 535 East Dock Street
3. City, State and ZIP: Tacoma, WA, 98402
4. Contact Name: Su Dowie
5. Contact Email: sdowie@theafoss.com
6. Phone: 253-597-8122 FAX: 253-597-8129
7. Transporter Name: To be determined (TBD)
8. Transporter ID # (if appl.): _____
9. Transporter Address: _____
10. City, State and ZIP: _____

C. Waste Stream Information

☐ USEPA Hazardous ☑ State Hazardous ☐ TSCA

1. Description
   a. Name of Waste: Metals-contaminated soil and fill (fill includes soil, concrete and wood debris)
   b. Process Generating Waste:
   Remedial actions at 2110 East D Street (Site). Past Site use includes previous filling and former light industrial activities (metal plating operations). Remedial actions include excavation of metals-contaminated soil and fill.
   c. Color: Brown
   d. Strong Odor (describe): N/A
   e. Physical State at 70°F: ☑ Solid ☐ Liquid ☐ Gas ☐ Sludge ☐ Other: _____
   f. Layers? ☑ Single layer ☐ Multi- layer
   g. Free Liquid Range (%) _____ to _____ Specific Gravity: _____ Viscosity: _____ BTU/lb: _____
   h. pH Range: _____ to _____ ☑ NA (Solid)
   i. Liquid Flash Point: ☐ < 140°F ☐ 140°- 199°F ☐ ≥ 200°F ☑ NA(solid)
2. Is this a USEPA hazardous waste (40 CFR Part 261)? If the answer is no, skip to question f. ☐ Yes ☐ No
   a. If yes, identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U).
   _____
   b. If a characteristic hazardous waste, do underlying hazardous constituents (UHCs) apply (40 CFR 268.48)? ☐ Yes ☐ No
   (if yes, list in Section C.2.j)
   c. Is the waste subject to RCRA Subpart CC Controls (40 CFR 264.1083 & 265.1084)? ☐ ? Click for Add'l Info ☐ Yes ☐ No
      1. If no, does the waste meet the organic LDR Exemption? ☐ Yes ☐ No
      2. If no, does the waste contain <500 ppm volatile organic (VOC's)? ☐ Yes ☐ No
      3. Volatile organic concentration _____ ppm.
   d. Is the waste predominately debris subject to the Alternate Debris Standards (40 CFR 268.45)? ☐ Yes ☐ No
   e. Is the waste predominately soil subject to the Alternate Soil Treatment Standards (40 CFR 268.49)? ☐ Yes ☐ No
      1. If yes, will Underlying Hazardous Constituents apply? (list in C.2.j) ☐ Yes ☐ No
   f. Does the waste represented by this profile contain asbestos? ☐ Yes ☑ No
      2. If yes: ☐ Friable ☐ Non-Friable
   g. Does the waste represented by this profile contain benzene? ☐ Yes ☑ No
      1. Is this subject to Benzene Operations Waste NESHAP (40 CFR Part 61 Subpart FF)? ☐ Yes ☐ No
      If yes, complete Benzene Waste Operations NESHAP (BWON) questionnaire.

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WASTE MANAGEMENT

Generator's Hazardous Waste Profile Sheet

Profile Number OR306485

C. Waste Stream Information (continued)

h. Is this profile for remediation waste from a facility that is a major source of Hazardous Air Pollutants (Site Remediation NESHAP, 40 CFR 63 subpart GGGGG)? ☐ Yes ☑ No

1. If yes, does the waste contain <500 ppm VOHAPs at the point of determination? ☐ Yes ☐ No

i. Does the waste represented by this waste profile sheet contain Polychlorinated Biphenyls (PCBs)? ☐ Yes ☑ No

(If yes, list in Chemical Composition - C.2.j)

1. If yes, are the PCBs regulated by 40 CFR 761? ☐ Yes ☐ No
2. If yes, is it remediation waste from a project being performed under the Self-Implementing option provided in 40 CFR 761.61(a)? ☐ Yes ☐ No
3. If yes, were the PCBs imported into the US? ☐ Yes ☐ No

j. Chemical Composition (List all constituents [including halogenated organics, debris, and UHC's] present in any concentration and submit representative analysis): ☐ (See Attached - for entering additional constituents)

Constituents (Total Composition Must be ≥ 100%)	Lower Range	Unit of Measure	Upper Range	Unit of Measure
1. Metals-contaminated soi/fill			70%-100%	% by weight
2. Concrete and wood debris			0%-30%	% by weight
3.				
4.				
5.				
6.				

k. Check any that apply: ☐ Pyrophoric ☐ Water Reactive ☐ OSHA Carcinogen ☐ Shock Sensitive ☐ Oxidizer ☐ Infectious

l. Is the waste subject to controls as a Group 1 wastewater or residual under the Hazardous Organic NESHAP? ☐ Yes ☑ No

1. If yes, is it a Table 8 _____ or Table 9 _____ compound?

m. Does the waste represented by this waste profile sheet contain radioactive material? ☐ Yes ☑ No

1. Is disposal regulated by the Nuclear Regulatory Commission? ☐ Yes ☐ No
2. If NORM, identify isotopes and concentration, _____ pCi/g.

n. Is the waste from a CERCLA (40 CFR 300, Appendix B) or state mandated clean-up? ☑ Yes ☐ No

1. If yes, attach Record of Decision (ROD), 104/106 or 122 order or court order that governs site clean-up for activity. For state mandated clean-up, provide relevant documentation.

o. Is this a State Hazardous Waste? ☑ Yes ☐ No

1. If yes, please list applicable codes: _____

If NY waste codes B001-B007 apply, please complete question C.2.c on page 1.

D. DOT Information and Shipping Volume

1. Quantity of Waste
   a. ☑ One Time Event ☐ Base ☐ Repeat Event
   b. Estimated Annual Quantity: 500 ☑ Tons ☐ Yards ☐ Drums ☐ Other (specify) _____
   c. Shipping Frequency: Units: One time Per: ☐ Month ☐ Quarter ☐ Year ☑ One Time ☐ Other _____
2. Shipping Information
   a. Packaging:
      ☑ Roll off/End dump: _____ ☐ Other: _____
      ☐ Drum Type/Size: _____ ☐ Vacuum Box
      ☐ Tanker ☐ Super Sack ☐ Tote Bin ☐ Cubic Yard Boxes
   b. Is this a U.S. Department of Transportation (USDOT) Hazardous Material (If no, skip c, d and e)? ☐ Yes ☐ No
   c. Reportable Quantity (lbs.; kgs.): _____ d. Primary/Subsidiary Hazard Class(es)/ID#: _____
   e. USDOT Shipping Name: _____ PG: _____

E. Generator Certification (Please read and certify by signature below)

I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this wastestream. Any sample submitted is a representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. I authorize WMI to obtain a sample from any waste shipment for purposes of recertification. If this certification is made by a broker, the undersigned signs as authorized agent of the generator and has confirmed the information contained in this Profile Sheet from information provided by the generator and additional information as it has determined to be reasonably necessary. If approved for management, Contractor has all the necessary permits and licenses for the waste that has been characterized and identified by this approved profile. All revelant information within the possession of the Generator regarding known or suspected hazards pertaining to the waste will be disclosed to the contractor. All changes which occur in the character of the waste will be identified by the Generator and be disclosed to the Contractor prior to providing the waste to the Contractor.

Certification Signature: _____ Title: Interim Executive Director

Company Name: FWDA Name (Print): Su Dowie

Date: _____

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WASTE MANAGEMENT

HAZARDOUS WASTE PROFILE ADDENDUM

Profile Number: OR306485

F. Addendum to Waste Stream Information

1. If this is USEPA hazardous waste (40 CFR Part 261), identify ALL USEPA listed and characteristic waste code numbers (D, F, K, P, U):

2. Chemical Composition (List all constituents [including halogenated organics, debris, and UHC's] present in any concentration and submit representative analysis):

Constituents *(Total Composition Must be > 100%)*	Lower Range	Unit of Measure	Upper Range	Unit of Measure
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

3. Is this a State Hazardous Waste? ❑ Yes ❑ No

If yes, please list applicable codes

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Nick Rohrbach

From: Wimmer, Linda <LWimmer@wm.com>
Sent: Tuesday, November 15, 2011 5:43 PM
To: Nick Rohrbach
Subject: RE: EPA ID#: question and help please

Hi Nick,

The profile looks good for starters until you get the analytical back you can't really answer the other questions.

The sample protocol is good, I would recommend they do TCLP analysis for the metals rather than the totals as that will eliminate having to return for more analytical but that is up to you.

Thanks,

Linda

From: Nick Rohrbach [mailto:nrohrbach@geoengineers.com]
Sent: Tuesday, November 15, 2011 1:43 PM
To: Wimmer, Linda
Subject: RE: EPA ID#: question and help please

OK, Linda. I was able to start a draft haz waste profile online and the attached PDF is for your review. I've left a few boxes unchecked/blank until we have more information regarding the waste. Please let me know if this draft profile looks OK for inclusion into our construction specifications for bidding purposes.

Secondly, another thing I wanted to verify with you was our planned sampling protocols/analysis for the waste that will be produced during remedial actions. These include:

# of sample protocol: *At least one 3-point composite sample will be collected from each segregated stockpile. If segregated stockpiles exceed 100 yards, an additional 3-point composite sample will be collected for each additional 100 yard interval.*

Parameters for analysis: *The parameters selected for analysis are representative of contaminants associated with previous Site activities and include the following:*

1) Total Resource Conversation and Recovery Act (RCRA) metals by EPA method 6010;
2) Petroleum Hydrocarbons by NWTPH-G and NWTPH-Dx;
3) Volatile Organic Compounds (VOCs) by EPA method 8260B;
4) Total Cyanide by EPA method 4500.

If a sample concentration result for an individual metal is greater than the "20-times rule" (Calculations of TCLP Concentrations from Total Concentrations, EPA, September 21, 1992), follow-up TCLP analysis will be performed. Follow-up TCLP analysis will be performed for the individual metal in the sample that contains the individual metal at a concentration that is greater than the "20-times rule".

Let me know if these protocols seem reasonable for this project. Thanks, Nick

From: Wimmer, Linda [mailto:LWimmer@wm.com]
Sent: Tuesday, November 15, 2011 8:45 AM
To: Nick Rohrbach
Subject: RE: EPA ID#: question and help please

www.wmsolutions.com

Call me if you have problems signing on or questions in using this.

From: Nick Rohrbach [mailto:nrohrbach@geoengineers.com]
Sent: Tuesday, November 15, 2011 8:42 AM
To: Wimmer, Linda
Subject: RE: EPA ID#: question and help please

Good morning Linda. Could you send me the link to the online hazardous waste profile form I can fill out?

From: Wimmer, Linda [mailto:LWimmer@wm.com]
Sent: Monday, November 14, 2011 2:00 PM
To: Nick Rohrbach
Subject: RE: EPA ID#: question and help please

The EPA ID# has not been changed from the old company to the State so I am not sure? You might want to talk to DOE direct and ask that question.

From: Nick Rohrbach [mailto:nrohrbach@geoengineers.com]
Sent: Monday, November 14, 2011 1:58 PM
To: Wimmer, Linda
Subject: RE: EPA ID#: question and help please

Thanks Linda. Does this mean the perspective purchaser is the generator?

From: Wimmer, Linda [mailto:LWimmer@wm.com]
Sent: Monday, November 14, 2011 1:56 PM
To: Nick Rohrbach
Subject: EPA ID#: question and help please

Hi Nick,

This EPA ID# belongs to American Plating.

Thanks,

Linda

From: Carothers, Marjorie
Sent: Monday, November 14, 2011 1:41 PM
To: Wimmer, Linda
Subject: RE: question and help please

American Plating!

Marjorie Carothers
Technical Service Representative
Waste Management
Technical Service Center PNW
P: (503) 493-7871
F: (866) 333-2192

WM landfills provide over 26,000 acres of protected habitat for wildlife and 103 WM landfills and facilities are certified by the Wildlife Habitat Council.

From: Wimmer, Linda
Sent: Monday, November 14, 2011 1:40 PM
To: Carothers, Marjorie
Subject: question and help please

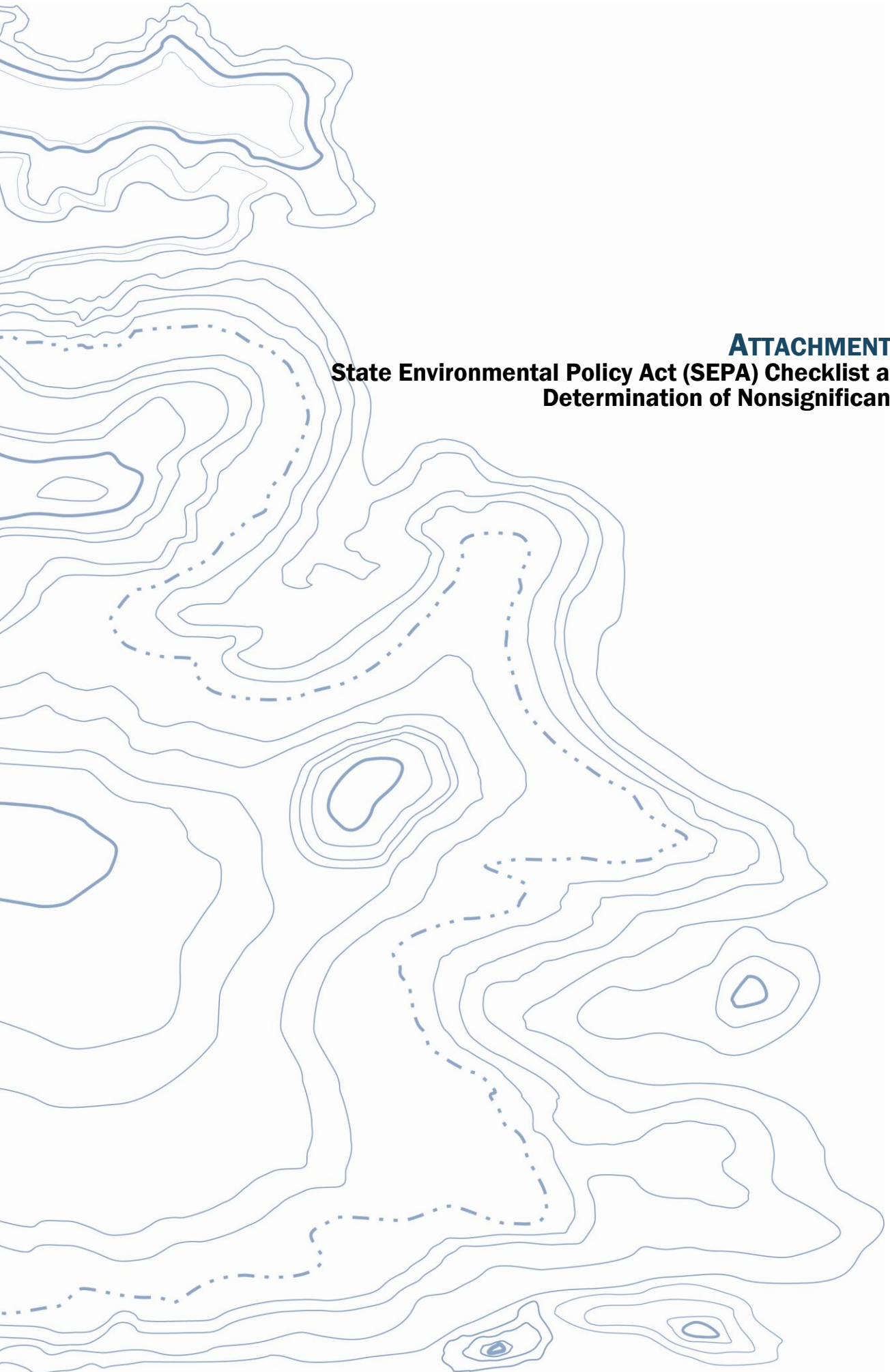
Can you look at this EPA ID # and tell me who this belongs to? WAD 083 350 231 in Tacoma, 2110 East D St Tacoma, WA

Linda Wimmer
Linda Wimmer
Industrial Account Manager
(206) 384-5760 cell
(866) 713-3508 fax
www.wmsolutions.com

Waste Management recycled more than 30,000 tons of aluminum in 2005, saving enough energy to run a TV for almost 6 billion hours.

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

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ATTACHMENT 7
State Environmental Policy Act (SEPA) Checklist and Determination of Nonsignificance

RECEIVED
NOV 18 2003
Washington State
Department of Ecology

SEPA Environmental Checklist
American Plating Company Site Remediation

A. BACKGROUND

1. **Name of Proposed Project, if Applicable**

American Plating Company Site Remediation, herein referred to as the Site.

2. **Name of Applicant/Proponent**

Foss Waterway Development Authority

3. **Address and Phone Number of Applicant and Contact Person**

Don Meyer, Executive Director
535 East Dock Street, Suite 204
Tacoma, WA 98402
(253) 597-8122
dmeyer@theafoss.com

4. **Date checklist Prepared**

November 17, 2003

5. **Agency Requesting Checklist**

Washington State Department of Ecology (Ecology)

6. **Proposed Timing or Schedule (including phasing, if applicable)**

The final Site development will be completed between 36 months and no later than 5 years from completion of the D Street Overpass. The overpass is being constructed within the D Street right-of-way by the City of Tacoma. Construction for the D Street Overpass is anticipated to begin in the spring of 2004.

The overpass construction activity necessitates a two-phased approach to the development of the Site, including separate phases of construction for temporary and permanent Site development. Site remediation activities will be incorporated into both the temporary and permanent Site development activities. Site remediation will include Site preparation, excavation and removal of contaminated soil, removal of concrete rubble and capping of contaminated soils.

Site development to prepare the area for temporary use is expected to begin with the construction of the D Street Overpass, which is expected to begin in 2004. Site development to prepare the Site for its final planned use is expected to start in 2007 and be completed by 2009.

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

The temporary Site development will include providing access for the Berg Scaffolding business (Berg property) located directly south of the Site. The D Street Overpass construction activities will eliminate the current access to the Berg property and the only way to retain access will be across the Site. A portion of the Site will be temporarily used by the Berg property for storage of scaffolding equipment and parking by its employees and clients.

The Foss Waterway Development Authority (FWDA) intends the permanent use of the Site to be a public park (Park). The property immediately south of the Site is also planned for inclusion in the Park and is expected to house public restrooms, a rowing center building and green space. Final build-out for the Park will include hard surfaced roadways and parking areas as well as green space on the Site. Development of the Park includes a connection to the water with a float for non-motorized boating activities located north of the Site. The FWDA is currently working with the City of Tacoma to designate a portion of the Park shoreline (south of the Site) for habitat enhancements and restoration in conjunction with the EPA mandated in-water cleanup.

The permanent use of the Site is consistent with the Foss Waterway Design & Development Plan and Tacoma's comprehensive Land Use Management Plan developed in compliance with the Washington State Growth Management Act. The Park will provide public access that is consistent with the Shoreline Management Act and will enhance the pedestrian access component of the overpass.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

"Preliminary Site Assessment, American Plating Company Site, Tacoma, Washington," March 1986, prepared by the Environmental Protection Agency (EPA).

"Site Stabilization Activities, American Plating Company Site, Tacoma, Washington," July 1987, prepared by Northwest Enviroservices and overseen by Ecology.

"Phase I and Phase II Site Investigations and a Supplemental Groundwater Investigation, American Plating Company Site, Tacoma, Washington," 1988, 1989, 1994, prepared by Applied Geotechnology, Inc.

"RCRA Facility Assessment (RFA) Preparation, American Plating Company Site, Tacoma, Washington," July 1994, prepared by Science Applications International Corporation (SAIC).

"Comprehensive Groundwater Monitoring Evaluation, American Plating Company Site, Tacoma, Washington," January 1995, prepared by PRC Environmental Management, Inc.

"Site Hazard Assessment, American Plating Company Site, Tacoma, Washington," August 1997, prepared by Tacoma-Pierce County Health Department.

"Interim Action Plan, American Plating Company Site, Tacoma, Washington," September 2002, prepared by SAIC

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

We are not aware of any applications pending approval.

10. List any government approvals or permits that will be needed for your proposal, if known.

Remedial actions and Site development for temporary and permanent Site uses will require City of Tacoma building and land use permits. Construction activities conducted along the shoreline will be subject to the Water Pollution Control Act and Shoreline Management Act. Additionally, excavation and removal of contaminated materials and capping of contaminated areas will be subject to Ecology approval in accordance with Chapter 70.105D RCW (Model Toxics Control Act - MTCA) and Chapter 173-340 WAC (MTCA Regulations).

11. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and Site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The Site is situated east of the City of Tacoma's central business district occupying approximately 1.4 acres on the bank of the Thea Foss Waterway (Waterway). The Waterway is a 1.5-mile-long inlet off Commencement Bay that runs along the shoreline of downtown Tacoma. The Waterway was created in its present configuration as the "City Waterway" by dredging mudflats and an old channel of the Puyallup River between 1902 and 1905.

The location of the Site was formed by partial filling of tidelands in the early 1900s. Metal electroplating, including brass, cadmium, chromium, copper, nickel, and zinc plating took place on the Site from 1955 until 1986.

A preliminary Site assessment conducted by EPA in March 1986 determined that the Site posed a serious environmental threat and that high levels of plating wastes and contaminated materials were present on Site. Site stabilization activities were performed by Northwest Enviroservices and overseen by Ecology in June 1987. In 1988, 1989 and 1994 Applied Geotechnology, Inc. (AGI) conducted Phase I and Phase II Site Investigations and a supplemental Groundwater Investigation at the Site. The Tacoma-Pierce County Health Department completed a Site Hazard Assessment ranking on the Site in August 1997. The Site's ranking was determined to be a "2" under the Washington Ranking Method (WARM) and the Site was placed on Ecology's Hazardous Sites List. Hart Crowser, Inc. described a conceptual cleanup action scenario involving soil removal in February 2001. This work was conducted for the City of Tacoma as part of an evaluation of potential hazardous waste sites associated with the City's East D Street Grade Separation Project (D Street Overpass).

In the spring of 2003, Ecology conducted an Interim Action Cleanup (IAC) that addressed some, but not all of the contamination identified on site. Two buildings, a concrete pad and an underground storage tank (UST) were removed from the Site. Final Site Cleanup will be addressed as part of the Site Development, which will be performed in two phases.

Temporary Site Development will include constructing access for the Berg property business located directly south of the Site. Planned construction activities for the D Street Overpass will eliminate the current access to the Berg property and the only way to retain access will be across the Site. A portion of the Site will be temporarily used by the Berg property for storage of scaffolding equipment and parking by its employees and clients. Some remediation of contaminated materials may be performed as part of the construction of the temporary access features.

The FWDA intends the permanent use of the Site to be a public park. The property immediately south of the Site is also planned for inclusion in the Park and is expected to house public restrooms, a rowing center building and green space. Final build-out for the Park will include hard surfaced roadways and parking areas as well as green space on the Site. Development of the Park includes a connection to the water with a float for non-motorized boating activities located north of the Plating Site. The FWDA is currently working with the City of Tacoma to designate a portion of the Park shoreline (south of the Site) for habitat enhancements and restoration in conjunction with the EPA mandated in-water cleanup.

The permanent use of the Site is consistent with the Foss Waterway Design & Development Plan and Tacoma's comprehensive Land Use Management Plan developed in compliance with the Washington State Growth Management Act. The Park will provide public access that is consistent with the Shoreline Management Act and will enhance the pedestrian access component of the overpass.

12. **Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

The Site address is 2110 East D Street in Tacoma, Washington. The Site is located in the southwest 1/4 of the southwest 1/4 of Section 4, Township 20 North, Range 3 East, or at 47°14'35" latitude and -122°25'49" longitude. A vicinity map is attached as Figure 1 and a Site Plan as Figure 2.

B. ENVIRONMENTAL ELEMENTS

1. **Earth**

a. **General description of the Site**

The Site is generally rectangular in shape, measuring approximately 200 feet by 300 feet. The Site is bounded on the north by the Elliot Bay Marina (formerly Pick's Cove), on the west by the Waterway, on the east by East D Street, and on the south by the Berg property. From East D Street, the Site slopes down to the west at about 2 percent to the Waterway, where the Site slopes at about 1-1/2H: 1V to 1H: 1V (horizontal to vertical) into the Waterway.

b. **What is the steepest slope on the Site (approximate percent slope)?**

Portions of the western bank reach approximately 1H: 1V slope. These slopes will be reduced as part of the ongoing remediation in the head of Waterway scheduled for completion in February 2004.

c. **What general types of soils are found on the Site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.**

Soil at the Site consists of fill of variable thickness overlying unconsolidated silt, which ranges from 0 to over 15 feet thick. Beneath the silt is a deposit of sand, gravel and silt, which ranges in thickness from 5 to over 10 feet. The deepest unit encountered is a dense to very dense silty sand to silty gravel of unknown thickness, which was encountered approximately 25 to 30 feet below the surface. This unit has been interpreted as a glacial till in the RCRA Facility Assessment prepared by SAIC in 1994.

d. **Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.**

Sloughing and raveling has been observed in soils near the former bulkhead on the western boundary of the Site. The bulkhead will be removed and the slopes re-contoured as part of the ongoing remediation in the head of Waterway, which is scheduled for completion in February 2004.

e. **Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.**

Contaminated soils exceeding soil cleanup levels will be excavated to a depth of 3 feet below design grade. Excavated areas will be replaced with a minimum of 2 feet of clean fill and a minimum of 1 foot of topsoil. The area will be graded to allow proper drainage and vegetated to prevent erosion. In areas where total cadmium or lead concentrations exceed soil cleanup levels below the 3 foot limit of excavation, a layer of permeable geotextile will be placed prior to backfilling. This fabric will serve as a marker to help prevent the inadvertent excavation of contaminated soil in the future. All fill needed to complete the project will be obtained from offsite sources.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

The Site is relatively flat and currently unpaved with portions consisting of gravel-surfaces to allow access onto the Site. During construction activities any runoff that is generated at the Site will be controlled using berms and silt fences to prevent discharge directly into the Waterway.

g. About what percent of the Site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The final Site Development Plan has not yet been determined, however, it is anticipated that less than 30 percent of the Site will be covered with impervious surfaces. These surfaces will likely consist of roadways, sidewalks and parking areas.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

During Site development the contractor will prepare and implement a temporary erosion and sediment control plan prior to ground disturbing activities. This plan will include the following elements:

- Construction procedures will be designed to minimize the opportunity for erosion to occur. Clearing, grading, and excavation will be limited to those areas necessary for access to and work at the Site. The construction limits will be marked in the field and equipment will not be allowed outside the work area.
- Site preparation, earthwork and bank repair activities will be completed during drier weather to the extent practical. If wet weather occurs, stockpiles of excavated materials or erodable raw material such as soil, sand, and backfill materials will be covered with plastic or other protective covering. If storm events that cause siltation occur during construction, work will stop until the event ceases and flow subsides.
- Depending on slope and weather conditions, filter fences will be installed along the perimeter of the work areas to help confine sediment and runoff. Straw bales will be used if concentrated surface water flow is observed.
- Denuded areas will be covered with straw mulch as appropriate during construction to reduce rain and runoff impacts.
- Inspections of the erosion control measures will be conducted daily during construction to ensure the effectiveness of the measures and to determine the need for maintenance or additional measures.
- The contractor will have adequate materials on the Site to respond to weather conditions and will modify the construction plan to accommodate seasonal changes. If, in the opinion of the project engineer, additional erosion control measures are necessary, the contractor will change the plan as directed by the engineer.
- Until permanent controls have been established and the Site stabilized, periodic monitoring will be performed to evaluate the effectiveness of post-construction erosion controls. Any areas of observed significant erosion will be repaired using an appropriate combination of the methods discussed above.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Exhaust from construction equipment will contribute air emissions, but the impact will be temporary and will not significantly degrade air quality. Dust is expected to be minimal or non-existent because of the proximity of the Site to the Waterway and the fact that construction will occur in the later winter/early spring period. Visual observations will be made by the contractor to monitor dust emissions from the Site. Once the project has been completed, it is anticipated there will be no emissions from the Site.

b. **Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.**

None.

c. **Proposed measures to reduce or control emissions or other impacts to air, if any:**

Excavated soil stockpiles will be tarped. If dusting is observed during construction, watering will be used to control dust.

3. **Water**

a. **Surface**

1) **Is there any surface water body on or in the immediate vicinity of the Site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.**

The Site is adjacent to the Waterway, an embayment of Commencement Bay.

2) **Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.**

No work is planned to occur over the water or along the Waterway bank. The majority of the Site development and remediation work will occur within the 200-foot zone. Final Site Development Plans have not been completed, but it is anticipated that the Site will be used as a public park that will consist of walkways, grassy areas and public parking. No structures are planned for the Site.

3) **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the Site that would be affected. Indicate the source of fill material.**

None anticipated.

4) **Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.**

No surface water withdrawals or diversions will be required. Minor amounts of water needed during construction and Site development will be obtained from a municipal source.

5) **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

The majority of the Site lies within the 100-year floodplain.

6) **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

No waste soils or water will be discharged into the Waterway. All wastes generated will be hauled off-site for disposal at an approved facility.

b. Ground

1) **Will groundwater be withdrawn, or will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.**

Minor amounts of groundwater (approximately 30 gallons per year) will be withdrawn from existing monitoring wells as part of the Site Compliance Monitoring Program. Wastewater will not be discharged onto the ground or to groundwater.

2) **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example, domestic sewage; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

N/A.

c. **Water runoff (including stormwater).**

1) **Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

Because the Site is bounded by East D Street along the upgradient side, relatively little stormwater is expected to flow onto the Site from the east. North of and crossgradient to the Site is an impervious surface. The existing surface drainage at the Site is west towards the Waterway. Most of the stormwater is anticipated to be generated from the impervious surface to the north, or by direct precipitation onto the Site. Stormwater from these areas likely will infiltrate into Site soils. Any stormwater that does run off will be diverted around the excavation area through sediment and oil control structures (i.e., silt fences and sorbent booms.), before it enters the Waterway as surface water flow.

2) **Could waste materials enter ground or surface waters? If so, generally describe.**

It is not anticipated that excavated materials will enter ground or surface waters. Appropriate measures will be implemented to control any release of excavated materials.

d. **Proposed measures to reduce or control surface, ground, and runoff water impacts, if any.**

Excavated material will be stored in lined stockpile areas, and the wastes will be transported to approved offsite landfills. The remediation work at the Site will reduce the potential for contaminants to enter ground or surface waters. Runoff will be diverted around the work area at the Site to reduce the potential for any transport of excavated material by stormwater flow across the surface of the Site. Water discharged to the waterway as a result of stormwater flow diverted around the Site is not anticipated to contain any waste materials.

4. **Plants**

a. **Types of vegetation found on the site.**

There are blackberry bushes and grass along the shoreline as well as on the southern portion of the Site. There are two trees (one cottonwood and one cherry) on the southern boundary of the Site, and two trees (crabapple) on the west side of the Site.

b. What kind and amount of vegetation will be removed or altered?

Himalayan blackberry bushes, which are an invasive non-native species, will be removed during construction. Some trees on the southern and western property boundaries may need to be removed to permit excavation activities and/or equipment access but will be replaced during Site restoration.

c. List threatened or endangered species known to be on or near the Site.

None.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the Site, if any.

The permanent use of the Site will be for the purpose of a public park. Typical park landscaping may be implemented at the Site, however, specifics will need to be addressed during final Site Development Plans. Other than the blackberries, the Site is sparsely vegetated. If any of the existing trees at the southern or western Site boundaries are removed or damaged during construction, they will be replaced with trees of the same species and similar size. Plans to establish a vegetative buffer zone will be reviewed as final Site Development Plans are prepared.

5. Animals

a. Birds and animals which have been observed on or near the Site or are known to be on or near the Site.

Songbirds, waterfowl, fish.

b. List any threatened or endangered species known to be on or near the Site.

Individuals of threatened populations of chinook salmon and bull trout and of the candidate species coho salmon could use the Waterway, although this is not a preferred habitat for any of these species due to the closed nature of the Waterway, its heavily urbanized and industrialized nature, and areas of sediment contamination. No eagle nests have been reported within a mile of the Site and no other use of the project vicinity by eagles has been reported although perching or foraging could occur there.

c. Is the Site part of a migration route? If so, explain.

No, although adult salmon may stray into this area during their upstream migration, and juveniles may occasionally use the nearshore area during their migration to open marine waters.

d. Proposed measures to preserve or enhance wildlife, if any.

N/A.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Gasoline and diesel will be used to power construction equipment. The project will not result in any change in energy usage at the Site.

b. **Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.**

No.

c. **What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any.**

N/A.

7. **Environmental Health**

a. **Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe.**

The purpose of the project is to cap potential environmental hazards in place and/or to remove potential environmental hazards from the Site, transport them for off-site disposal, and replace the excavated material with clean fill. The cleanup action plan incorporates a variety of provisions to ensure that the hazard is effectively contained and prevented from reaching human or ecological receptors.

1) **Describe special emergency services that might be required.**

The only emergency services that might be required are those that are associated with any construction project that involves excavators and other heavy equipment for earthwork projects.

2) **Proposed measures to reduce or control environmental health hazards, if any.**

A Site Health and Safety Plan, approved by Ecology, will be in place from beginning to completion of the project.

b. Noise

1) **What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?**

Ambient noise at the Site is caused primarily by vehicle traffic on East D Street and the Highway 509 bridge, train traffic along the railroad tracks south of the Site, and occasional vessel traffic and general industrial activity along the Waterway. These noise sources will have no effect on the project.

2) **What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the Site.**

Construction noise will be generated at the Site during daylight hours during the remediation period.

3) **Proposed measures to reduce or control noise impacts, if any:**

Mufflers will be used on construction equipment.

8. **Land and Shoreline Use**

a. **What is the current use of the Site and adjacent properties?**

Currently, the Site is vacant. The property to the north is owned by the Elliot Bay Marina (formerly Pick's Cove). The property to the south is occupied by the Berg property. To the east of the Site is East D Street. The Waterway is present west of the Site and is used for boating/marine-type activities.

b. Has the Site been used for agriculture? If so, describe.

No.

c. Describe any structures on the Site.

None, however, a concrete rubble pile exists from a former concrete sump as described in Section B.1.a. above.

d. Will any structures be demolished? If so, what?

No.

e. What is the current zoning classification of the Site?

The Site is zoned as a high intensity, mixed commercial area, which is part of the Thea Foss Shoreline zoning (zoning classification S-8) (Tacoma 1999).

f. What is the current comprehensive plan designation of the Site?

The Site is included within the Thea Foss Waterway Design & Development Plan element of the City of Tacoma Comprehensive Plan.

g. If applicable, what is the current shoreline master program designation of the Site?

S-8 (urban) shoreline district.

h. Has any part of the Site been classified as an "environmentally sensitive" area? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

During the temporary phase of the project, part of the property will be used for employee and customer parking for the Berg property. There are no plans for any residents at the Site. Approximately 35 people would park on the Site, and work on the adjacent Berg property. Final development plans for the property do not include plans for workers to be present within the Park.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any.

None.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.

The FWDA has been consulting, and will continue to consult, with Ecology and the City of Tacoma planning staff to ensure that they are aware of the project plans and has an opportunity for input.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any.

None.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

No structures are planned for the Site.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any.

None.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None.

d. Proposed measures to reduce or control light and glare impacts, if any.

None.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Final Site Development Plans have not been completed, however, it is anticipated that the Site will be used as a public park. Recreational opportunities and facilities could include benches, walkways and grassy areas.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None.

13. Historic and Cultural Preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the Site? If so, generally describe.

No.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the Site.

None.

c. Proposed measures to reduce or control impacts, if any.

None.

14. Transportation

a. Identify public streets and highways serving the Site, and describe proposed access to the existing street system. Show on Site plans, if any.

East D Street runs along the eastern edge of the Site.

b. Is Site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

No. Public transit is available approximately 1,000 feet south of the Site.

c. How many parking spaces would the completed project have? How many would the project eliminate?

Final Site Development Plans have not been completed, however, it is anticipated that the Site will have approximately 30 parking spaces, which would be sufficient for a small public park. No parking spaces currently exist at the Site.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. **Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.**

Construction equipment and personnel will access the Site via East D Street. Railroad tracks occur south of the site but will not be used for this project.

f. **How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.**

The completed project will generate daytime vehicular trips typically associated with a small public park, which are estimated at 20 per day. Peak traffic volumes likely would occur on weekends during daylight hours.

g. **Proposed measures to reduce or control transportation impacts, if any.**

None.

15. **Public Services**

a. **Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.**

No.

b. **Proposed measures to reduce or control direct impacts on public services, if any.**

None.

16. **Utilities**

a. **Utilities currently available at the Site.**

Electricity, natural gas, water, telephone, and sanitary sewer lines are located near and along the eastern boundary of the Site.

b. **Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the Site or in the immediate vicinity, which might be needed.**

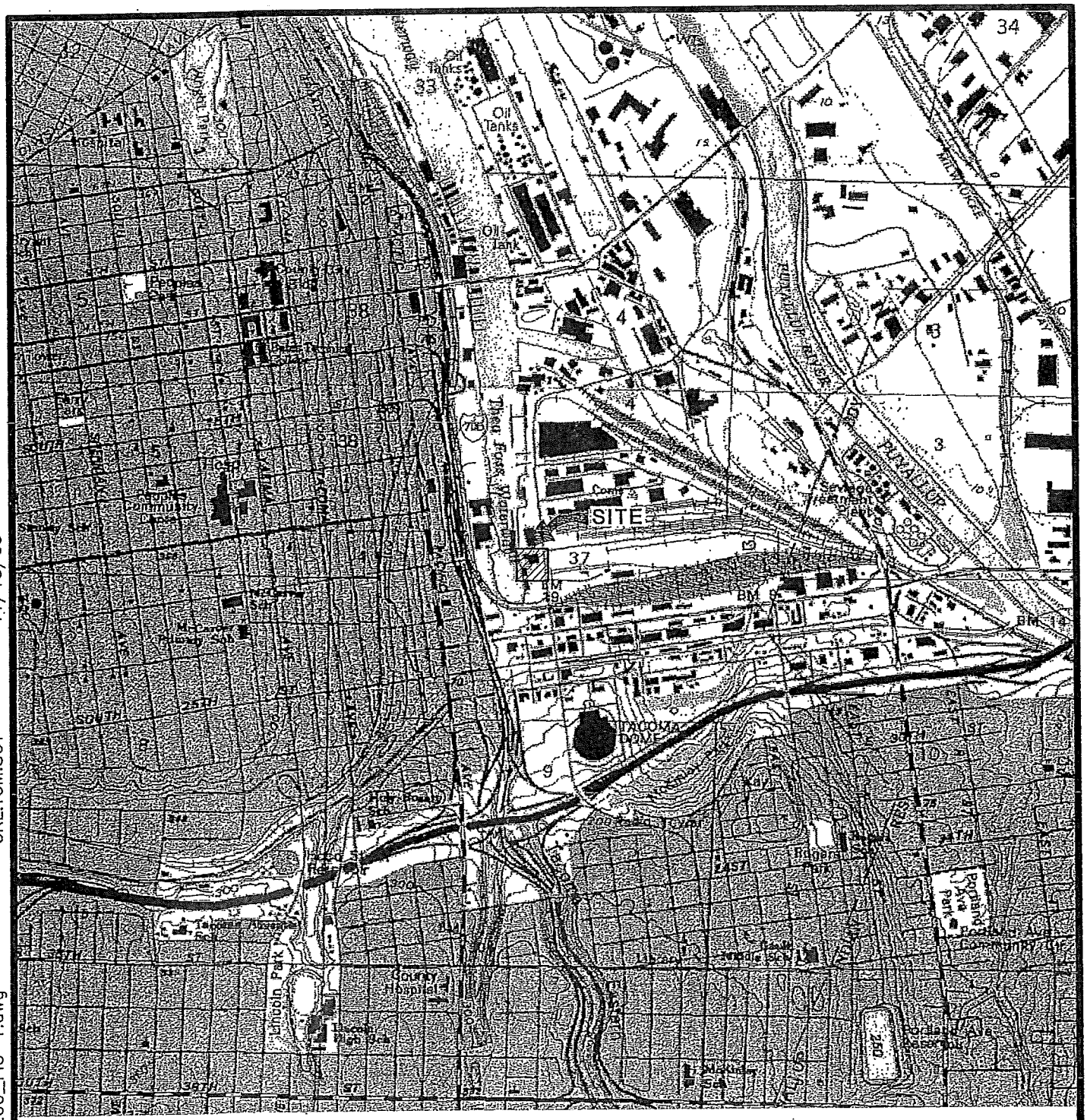
This project would not change the type or location of utilities on the Site.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Donald L Meyer

Date Submitted: 11-17-03


SITE
TACOMA DOME
Oil Tanks
Oil Tanks
Oil Tank
Thea Foss Waterway
PUYALLUP
Lincoln Park
Point Ruston
Ruston Way
Pioneer Park
Titlow Park
Point Defiance Park
Community Center
Hospital
Library
Cemetery
Golf Course
Tennis
Pool
Ball Field
Picnic Area
Boat Ramp
Sewage Treatment Plant
Fire Station
Police Station
Post Office
Marina
Yacht Club
Ferry Terminal
Amphitheater
Museum
Aquarium
Zoo
Gas
Tanks
Stadium
Arena
Convention Center
Theater
Auditorium
Fairgrounds
Exhibition Hall
Shopping Center
Mall
Bridge
Tunnel
Overpass
Underpass
Railroad
Freeway
Highway
Interstate
Expressway
Boulevard
Avenue
Street
Drive
Road
Lane
Court
Place
Terrace
Circle
Trail
Path
Parking
Garage
Lot
Building
Church
School
Park
Playground
Golf
Course
Tennis
Court
Pool
Ball
Field
Picnic
Area
Boat
Ramp
Marina
Yacht
Club
Ferry
Terminal
Amphitheater
Museum
Aquarium
Zoo
Gas
Tanks
Stadium
Arena
Convention
Center
Theater
Auditorium
Fairgrounds
Exhibition
Hall
Shopping

WAC 197-11-970 Determination of Nonsignificance (DNS).

DETERMINATION OF NONSIGNIFICANCE

Description of proposal: American Plating Company Site Remediation _____

_____

_____

Proponent: Foss Waterway Development Authority _____

Location of proposal, including street address, if any: 2110 East D Street, Tacoma, Washington; Site location is southwest ¼ of the southwest ¼ of Section 4, Township 20 North, Range 3 East and at latitude North 47° 14' 37" and longitude West 122° 25' 51". _____

Lead agency: Washington State Department of Ecology _____

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030 (2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

☐ There is no comment period for this DNS.

☐ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.

X This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by 12/29/03

Responsible official: Rebecca S. Lawson, P.E. _____

Position/title: Regional Section Manager, Toxics Cleanup Program _____ Phone: (360) 407-6241

Address: Southwest Regional Office, P.O. Box 47775, Olympia, Washington 98504-7775 _____

Date. 11/28/03 Signature Rebecca S. Lawson

(OPTIONAL)

☐ You may appeal this determination to (name) _____

at (location) _____

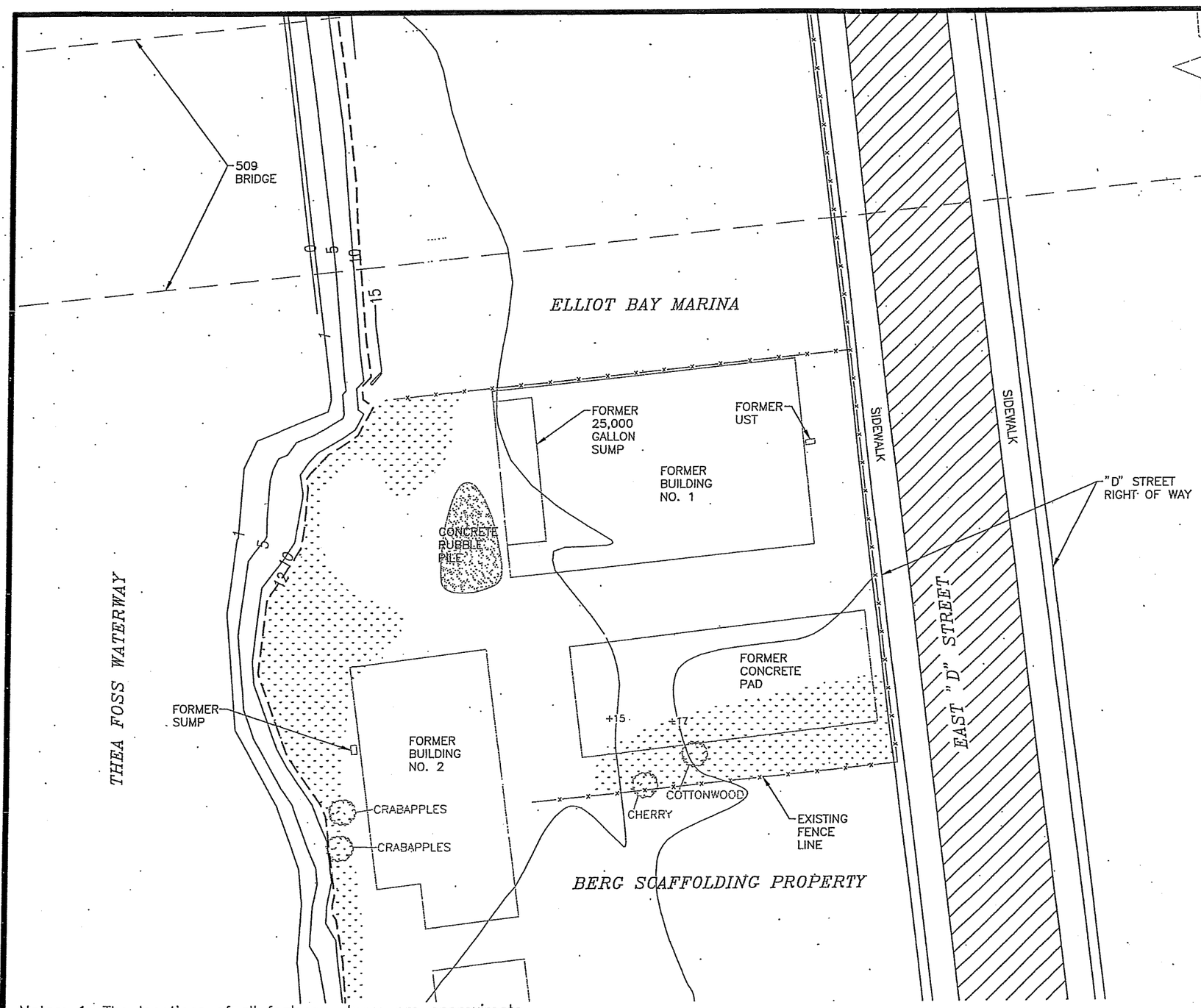
no later than (date) _____

by (method) .....

You should be prepared to make specific factual objections.

Contact _____ to read or ask about the procedures for SEPA appeals.

X There is no agency appeal.



EXPLANATION:

- ORDINARY HIGH WATER MARK
- GRASS AND BLACKBERRY BUSHES
- TREE
- UST — UNDERGROUND STORAGE TANK

NOTE:

1. ELEVATION SHOWN IS MEAN LOWER LOW WATER (MLLW).

0 50 100

APPROXIMATE SCALE IN FEET

Notes: 1. The locations of all features shown are approximate.
2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data ɔ not guarantee these data are accurate or complete. There may have been updates to the

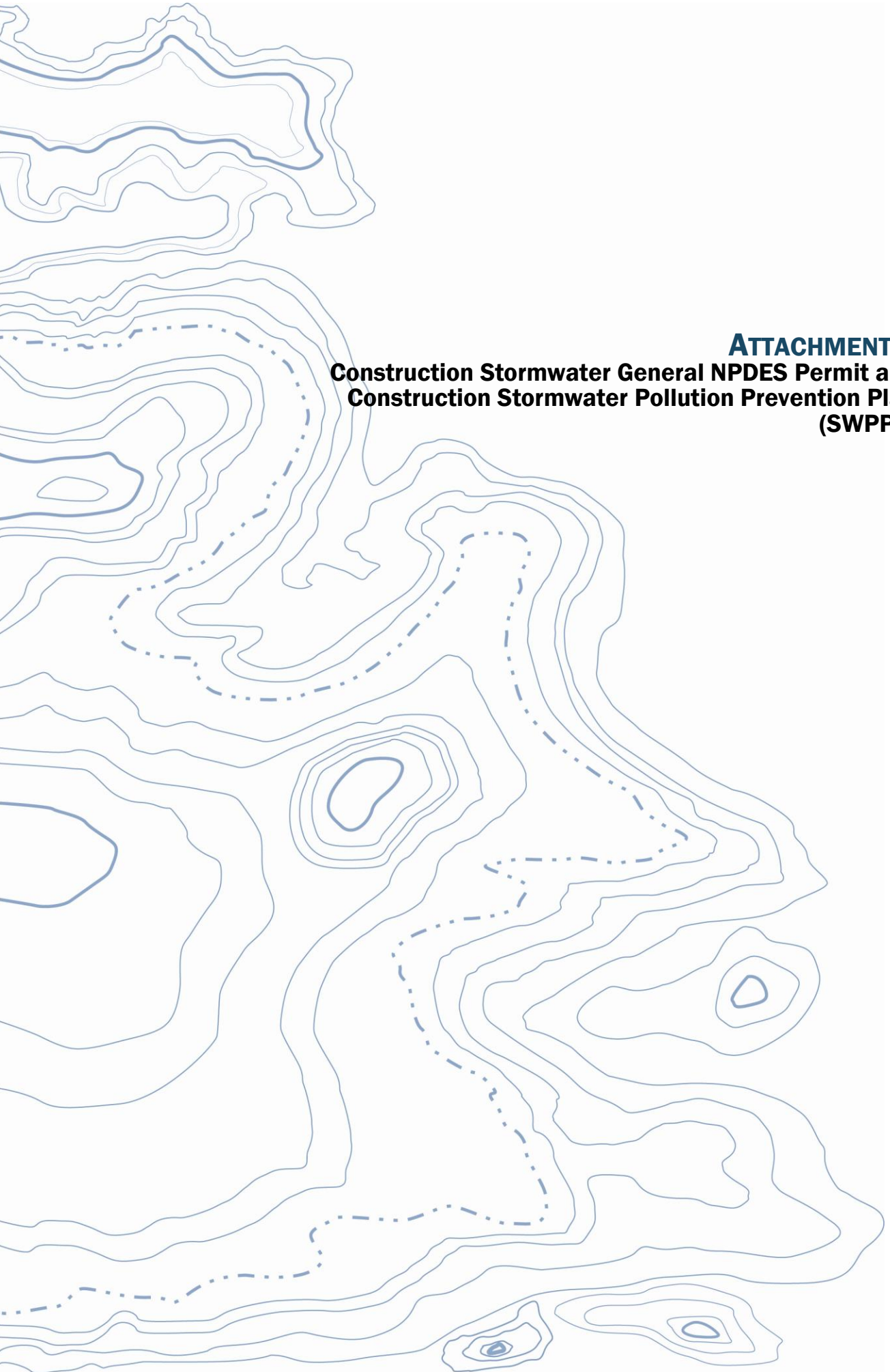
Reference: Drawing created from sketch provided by GeoEngineers' personnel.

GeoEngineers

SITE PLAN

FIGURE 2

TACO\10\10751002\00\CAD\1075



ATTACHMENT 8

Construction Stormwater General NPDES Permit and Construction Stormwater Pollution Prevention Plan (SWPPP)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
TTY 711 or 800-833-6388 (for the speech or hearing impaired)

RECEIVED
DEC 19 2011

December 15, 2011

Su Dowie
Foss Waterway Development Authority
535 E Dock Street #204
Tacoma, WA 98402-4630

RE: Coverage under the Construction Stormwater General Permit

Permit number:	**WAR-125447**
Site Name:	**American Plating Remediation Project**
Location:	**2110 East D St**
	Tacoma, WA **County: Pierce**
Disturbed Acres:	**1.4**

Dear Ms. Dowie:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (permit). This is your permit coverage letter. Your permit coverage is effective on December 15, 2011. **Please retain this permit coverage letter with your permit (enclosed), stormwater pollution prevention plan (SWPPP), and site log book. These materials are the official record of permit coverage for your site.**

Please take time to read the entire permit and contact Ecology if you have any questions.

Appeal Process
You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this letter. This appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do the following within 30 days of the date of receipt of this letter:

- File your appeal and a copy of the permit cover page with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and the permit cover page on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Address and Location Information:

Street Addresses:	**Mailing Addresses:**
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board (PCHB) 1111 Israel Road SW, Suite 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

Electronic Discharge Monitoring Reports (WAWebDMR)
This permit requires that Permittees submit monthly discharge monitoring reports (DMRs) electronically using Ecology's secure online system, WAWebDMR. To sign up for WAWebDMR go to: www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html. If you have questions, contact Tonya Wolfe at (360) 407-7097 (locally), or (800) 633-6193/option 3, or email WAWebDMR@ecy.wa.gov.

Ecology Field Inspector Assistance
If you have questions regarding stormwater management at your construction site, please contact Stephanie Jackson of Ecology's Southwest Regional Office in Lacey at (360) 407-6294, or stephanie.jackson@ecy.wa.gov.

Questions or Additional Information
Ecology is committed to providing assistance. Please review our web page at: www.ecy.wa.gov/programs/wq/stormwater/construction/. If you have questions about the construction stormwater general permit, please contact Josh Klimek at (360) 407-7451, or josh.klimek@ecy.wa.gov.

Sincerely,

Bill Moore, P.E.
Program Development Services, Section Manager
Water Quality Program

Enclosure

Issuance Date: December 1, 2010
Effective Date: January 1, 2011
Expiration Date: December 31, 2015

CONSTRUCTION STORMWATER GENERAL PERMIT

National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity

State of Washington
Department of Ecology
Olympia, Washington 98504

In compliance with the provisions of
Chapter 90.48 Revised Code of Washington
(State of Washington Water Pollution Control Act)
and
Title 33 United States Code, Section 1251 et seq.
The Federal Water Pollution Control Act (The Clean Water Act)

Until this permit expires, is modified or revoked, Permittees that have properly obtained coverage under this general permit are authorized to discharge in accordance with the special and general conditions that follow.

Kelly Susewind, P.E., P.G.
Water Quality Program Manager
Washington State Department of Ecology

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SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions within this permit for additional submittal requirements. Appendix A provides a list of definitions. Appendix B provides a list of acronyms.

Table 1. Summary of Permit Report Submittals

Permit Section	Submittal	Frequency	First Submittal Date
S5.A and S8	High Turbidity/Transparency Phone Reporting	As Necessary	Within 24 hours
S5.B	Discharge Monitoring Report	Monthly*	Within 15 days of applicable monitoring period
S5.F and S8	Noncompliance Notification	As necessary	Immediately
S5.F	Noncompliance Notification – Written Report	As necessary	Within 5 Days of non-compliance
G2.	Notice of Change in Authorization	As necessary	
G6.	Permit Application for Substantive Changes to the Discharge	As necessary	
G8.	Application for Permit Renewal	1/permit cycle	No later than 180 days before expiration
G9.	Notice of Permit Transfer	As necessary	
G20.	Notice of Planned Changes	As necessary	
G22.	Reporting Anticipated Non-compliance	As necessary	

SPECIAL NOTE: *Permittees must submit Discharge Monitoring Reports (DMRs) to the Washington State Department of Ecology monthly, regardless of site discharge, for the full duration of permit coverage. Refer to Section S5.B of this General Permit for more specific information regarding DMRs.

Table 2. Summary of Required On-site Documentation

Document Title	Permit Conditions
Permit Coverage Letter	See Conditions S2, S5
Construction Stormwater General Permit	See Conditions S2, S5
Site Log Book	See Conditions S4, S5
Stormwater Pollution Prevention Plan (SWPPP)	See Conditions S9, S5

SPECIAL CONDITIONS

S1. PERMIT COVERAGE

A. Permit Area

This Construction Stormwater General Permit (CSWGP) covers all areas of Washington State, except for federal and Tribal lands as specified in Special Condition S1.E.3.

B. Operators Required to Seek Coverage Under this General Permit:

1. Operators of the following construction activities are required to seek coverage under this CSWGP:

   a. Clearing, grading and/or excavation that results in the disturbance of one or more acres and discharges stormwater to surface waters of the State; and clearing, grading and/or excavation on sites smaller than one acre that are part of a larger common plan of development or sale, if the common plan of development or sale will ultimately disturb one acre or more and discharge stormwater to surface waters of the State.

      i. This includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, and discharge to surface waters of the State (that is, forest practices that prepare a site for construction activities); and

   b. Any size construction activity discharging stormwater to waters of the State that the Department of Ecology ("Ecology"):

      i. Determines to be a significant contributor of pollutants to waters of the State of Washington.

      ii. Reasonably expects to cause a violation of any water quality standard.

2. Operators of the following activities are not required to seek coverage under this CSWGP (unless specifically required under Special Condition S1.B.1.b. above):

   a. Construction activities that discharge all stormwater and non-stormwater to ground water, sanitary sewer, or combined sewer, and have no point source discharge to either surface water or a storm sewer system that drains to surface waters of the State.

   b. Construction activities covered under an Erosivity Waiver (Special Condition S2.C).

   c. Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

C. Authorized Discharges:

1. Stormwater Associated with Construction Activity. Subject to compliance with the terms and conditions of this permit, Permittees are authorized to discharge stormwater associated with construction activity to surface waters of the State or to a storm sewer system that drains to surface waters of the State. (Note that "surface waters of the State" may exist on a construction site as well as off site; for example, a creek running through a site.)

2. Stormwater Associated with Construction Support Activity. This permit also authorizes stormwater discharge from support activities related to the permitted construction site (for example, an on-site portable rock crusher, off-site equipment staging yards, material storage areas, borrow areas, etc.) provided:

   a. The support activity relates directly to the permitted construction site that is required to have a NPDES permit; and

   b. The support activity is not a commercial operation serving multiple unrelated construction projects, and does not operate beyond the completion of the construction activity; and

   c. Appropriate controls and measures are identified in the Stormwater Pollution Prevention Plan (SWPPP) for the discharges from the support activity areas.

3. Non-Stormwater Discharges. The categories and sources of non-stormwater discharges identified below are authorized conditionally, provided the discharge is consistent with the terms and conditions of this permit:

   a. Discharges from fire-fighting activities.

   b. Fire hydrant system flushing.

   c. Potable water, including uncontaminated water line flushing.

   d. Pipeline hydrostatic test water.

   e. Uncontaminated air conditioning or compressor condensate.

   f. Uncontaminated ground water or spring water.

   g. Uncontaminated excavation dewatering water (in accordance with S9.D.10).

   h. Uncontaminated discharges from foundation or footing drains.

   i. Water used to control dust. Permittees must minimize the amount of dust control water used.

   j. Routine external building wash down that does not use detergents.

   k. Landscape irrigation water.

   The SWPPP must adequately address all authorized non-stormwater discharges, except for discharges from fire-fighting activities, and must comply with Special

Condition S3. At a minimum, discharges from potable water (including water line flushing), fire hydrant system flushing, and pipeline hydrostatic test water must undergo the following: dechlorination to a concentration of 0.1 parts per million (ppm) or less, and pH adjustment to within 6.5 – 8.5 standard units (su), if necessary.

D. Prohibited Discharges:

The following discharges to waters of the State, including ground water, are prohibited.

1. Concrete wastewater.
2. Wastewater from washout and clean-up of stucco, paint, form release oils, curing compounds and other construction materials.
3. Process wastewater as defined by 40 Code of Federal Regulations (CFR) 122.1 (see Appendix A of this permit).
4. Slurry materials and waste from shaft drilling.
5. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.
6. Soaps or solvents used in vehicle and equipment washing.
7. Wheel wash wastewater, unless discharged according to Special Condition S9.D.9.d.
8. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed according to Special Condition S9.D.10.

E. Limits on Coverage

Ecology may require any discharger to apply for and obtain coverage under an individual permit or another more specific general permit. Such alternative coverage will be required when Ecology determines that this CSWGP does not provide adequate assurance that water quality will be protected, or there is a reasonable potential for the project to cause or contribute to a violation of water quality standards.

The following stormwater discharges are not covered by this permit:

1. Post-construction stormwater discharges that originate from the site after completion of construction activities and the site has undergone final stabilization.
2. Non-point source silvicultural activities such as nursery operations, site preparation, reforestation and subsequent cultural treatment, thinning, prescribed burning, pest and fire control, harvesting operations, surface drainage, or road construction and maintenance, from which there is natural runoff as excluded in 40 CFR Subpart 122.
3. Stormwater from any federal project or project on federal land or land within an Indian Reservation except for the Puyallup Reservation. Within the Puyallup

Reservation, any project that discharges to surface water on land held in trust by the federal government may be covered by this permit.

4. Stormwater from any site covered under an existing NPDES individual permit in which stormwater management and/or treatment requirements are included for all stormwater discharges associated with construction activity.

5. Stormwater from a site where an applicable Total Maximum Daily Load (TMDL) requirement specifically precludes or prohibits discharges from construction activity.

S2. APPLICATION REQUIREMENTS

A. Permit Application Forms

1. Notice of Intent Form/Timeline

a. Operators of new or previously unpermitted construction activities must submit a complete and accurate permit application (Notice of Intent, or NOI) to Ecology.

b. The operator must submit the NOI at least 60 days before discharging stormwater from construction activities and must submit it on or before the date of the first public notice (see Special Condition S2.B below for details). The 30-day public comment period required by WAC 173-226-130(5) begins on the publication date of the second public notice. Unless Ecology responds to the complete application in writing, based on public comments, or any other relevant factors, coverage under the general permit will automatically commence on the thirty-first day following receipt by Ecology of a completed NOI, or the issuance date of this permit, whichever is later, unless Ecology specifies a later date in writing.

c. Applicants who propose to discharge to a storm or sewer system operated by Seattle, King County, Snohomish County, Tacoma, Pierce County, or Clark County must also submit a copy of the NOI to the appropriate jurisdiction.

d. If an applicant intends to use a Best Management Practice (BMP) selected on the basis of Special Condition S9.C.4 ("demonstrably equivalent" BMPs), the applicant must notify Ecology of its selection as part of the NOI. In the event the applicant selects BMPs after submission of the NOI, it must provide notice of the selection of an equivalent BMP to Ecology at least 60 days before intended use of the equivalent BMP.

e. Permittees must notify Ecology regarding any changes to the information provided on the NOI by submitting an updated NOI. Examples of such changes include, but are not limited to,

i. changes to the Permittee's mailing address,

ii. changes to the on-site contact person information, and

iii. changes to the area/acreage affected by construction activity.

2. Transfer of Coverage Form

The Permittee can transfer current coverage under this permit to one or more new operators, including operators of sites within a Common Plan of Development, provided the Permittee submits a Transfer of Coverage Form in accordance with General Condition G9. Transfers do not require public notice.

B. Public Notice

For new or previously unpermitted construction activities, the applicant must publish a public notice at least one time each week for two consecutive weeks, at least 7 days apart, in a newspaper with general circulation in the county where the construction is to take place. The notice must contain:

1. A statement that "The applicant is seeking coverage under the Washington State Department of Ecology's Construction Stormwater NPDES and State Waste Discharge General Permit."

2. The name, address and location of the construction site.

3. The name and address of the applicant.

4. The type of construction activity that will result in a discharge (for example, residential construction, commercial construction, etc.), and the number of acres to be disturbed.

5. The name of the receiving water(s) (that is, the surface water(s) to which the site will discharge), or, if the discharge is through a storm sewer system, the name of the operator of the system.

6. The statement: "Any persons desiring to present their views to the Washington State Department of Ecology regarding this application, or interested in Ecology's action on this application, may notify Ecology in writing no later than 30 days of the last date of publication of this notice. Ecology reviews public comments and considers whether discharges from this project would cause a measurable change in receiving water quality, and, if so, whether the project is necessary and in the overriding public interest according to Tier II antidegradation requirements under WAC 173-201A-320. Comments can be submitted to: Department of Ecology, P.O. Box 47696, Olympia, WA 98504-7696 Attn: Water Quality Program, Construction Stormwater."

C. Erosivity Waiver

Construction site operators may qualify for an erosivity waiver from the CSWGP if the following conditions are met:

1. The site will result in the disturbance of fewer than 5 acres and the site is not a portion of a common plan of development or sale that will disturb 5 acres or greater.

2. Calculation of Erosivity "R" Factor and Regional Timeframe:

   a. The project's rainfall erosivity factor ("R" Factor) must be less than 5 during the period of construction activity, as calculated using either the Texas A&M University online rainfall erosivity calculator at: http://ei.tamu.edu/ or EPA's calculator at http://cfpub.epa.gov/npdes/stormwater/lew/lewcalculator.cfm. The period of construction activity starts when the land is first disturbed and ends with final stabilization. In addition:

   b. The entire period of construction activity must fall within the following timeframes:

      i. For sites west of the Cascades Crest: June 15 – September 15.

      ii. For sites east of the Cascades Crest, excluding the Central Basin: June 15 – October 15.

      iii. For sites east of the Cascades Crest, within the Central Basin: no additional timeframe restrictions apply. The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches. For a map of the Central Basin (Region 2), refer to http://www.ecy.wa.gov/pubs/ecy070202.pdf.

3. Construction site operators must submit a complete Erosivity Waiver certification form at least one week before disturbing the land. Certification must include statements that the operator will:

   a. Comply with applicable local stormwater requirements; and

   b. Implement appropriate erosion and sediment control BMPs to prevent violations of water quality standards.

4. This waiver is not available for facilities declared significant contributors of pollutants as defined in Special Condition S1.B.1.b.

5. This waiver does not apply to construction activities which include non-stormwater discharges listed in Special Condition S1.C.3.

6. If construction activity extends beyond the certified waiver period for any reason, the operator must either:

   a. Recalculate the rainfall erosivity "R" factor using the original start date and a new projected ending date and, if the "R" factor is still under 5 and the entire

project falls within the applicable regional timeframe in Special Condition S2.C.2.b, complete and submit an amended waiver certification form before the original waiver expires; or

b. Submit a complete permit application to Ecology in accordance with Special Condition S2.A and B before the end of the certified waiver period.

S3. COMPLIANCE WITH STANDARDS

A. Discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), ground water quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health-based criteria in the National Toxics Rule (40 CFR Part 131.36). Discharges not in compliance with these standards are not authorized.

B. Prior to the discharge of stormwater and non-stormwater to waters of the State, the Permittee must apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

C. Ecology presumes that a Permittee complies with water quality standards unless discharge monitoring data or other site-specific information demonstrates that a discharge causes or contributes to a violation of water quality standards, when the Permittee complies with the following conditions. The Permittee must fully:

1. Comply with all permit conditions, including planning, sampling, monitoring, reporting, and recordkeeping conditions.

2. Implement stormwater BMPs contained in stormwater management manuals published or approved by Ecology, or BMPs that are demonstrably equivalent to BMPs contained in stormwater technical manuals published or approved by Ecology, including the proper selection, implementation, and maintenance of all applicable and appropriate BMPs for on-site pollution control. (For purposes of this section, the stormwater manuals listed in Appendix 10 of the Phase I Municipal Stormwater Permit are approved by Ecology.)

D. Where construction sites also discharge to ground water, the ground water discharges must also meet the terms and conditions of this CSWGP. Permittees who discharge to ground water through an injection well must also comply with any applicable requirements of the Underground Injection Control (UIC) regulations, Chapter 173-218 WAC.

S4. MONITORING REQUIREMENTS, BENCHMARKS AND REPORTING TRIGGERS

Table 3. Summary of Primary Monitoring Requirements

Size of Soil Disturbance[1]	Weekly Site Inspections	Weekly Sampling w/ Turbidity Meter	Weekly Sampling w/ Transparency Tube	Weekly pH Sampling[2]	Requires CESCL Certification?
Sites that disturb less than 1 acre, but are part of a larger Common Plan of Development	Required	Not Required	Not Required	Not Required	No
Sites that disturb 1 acre or more, but fewer than 5 acres	Required	Sampling Required – either method[3]		Required	Yes
Sites that disturb 5 acres or more	Required	Required	Not Required[4]	Required	Yes

A. Site Log Book

The Permittee must maintain a site log book that contains a record of the implementation of the SWPPP and other permit requirements, including the installation and maintenance of BMPs, site inspections, and stormwater monitoring.

B. Site Inspections

The Permittee's (operator's) site inspections must include all areas disturbed by construction activities, all BMPs, and all stormwater discharge points. (See Special Conditions S4.B.3 and B.4 below for detailed requirements of the Permittee's Certified Erosion and Sediment Control Lead [CESCL]).

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[1] Soil disturbance is calculated by adding together all areas affected by construction activity. Construction activity means clearing, grading, excavation, and any other activity that disturbs the surface of the land, including ingress/egress from the site.

[2] If construction activity results in the disturbance of 1 acre or more, and involves significant concrete work (1,000 cubic yards of poured or recycled concrete over the life of a project) or the use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area drains to surface waters of the State or to a storm sewer stormwater collection system that drains to other surface waters of the State, the Permittee must conduct pH monitoring sampling in accordance with Special Condition S4.D.

[3] Sites with one or more acres, but fewer than 5 acres of soil disturbance, must conduct turbidity or transparency sampling in accordance with Special Condition S4.C.

[4] Sites equal to or greater than 5 acres of soil disturbance must conduct turbidity sampling using a turbidity meter in accordance with Special Condition S4.C.

Construction sites one acre or larger that discharge stormwater to surface waters of the State must have site inspections conducted by a certified CESCL. Sites less than one acre may have a person without CESCL certification conduct inspections; sampling is not required on sites that disturb less than an acre.

1. The Permittee must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen. The Permittee must evaluate the effectiveness of BMPs and determine if it is necessary to install, maintain, or repair BMPs to improve the quality of stormwater discharges.

   Based on the results of the inspection, the Permittee must correct the problems identified by:

   a. Reviewing the SWPPP for compliance with Special Condition S9 and making appropriate revisions within 7 days of the inspection.

   b. Immediately beginning the process of fully implementing and maintaining appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than within 10 days of the inspection. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period.

   c. Documenting BMP implementation and maintenance in the site log book.

2. The Permittee must inspect all areas disturbed by construction activities, all BMPs, and all stormwater discharge points at least once every calendar week and within 24 hours of any discharge from the site. (For purposes of this condition, individual discharge events that last more than one day do not require daily inspections. For example, if a stormwater pond discharges continuously over the course of a week, only one inspection is required that week.) The Permittee may reduce the inspection frequency for temporarily stabilized, inactive sites to once every calendar month.

3. The Permittee must have staff knowledgeable in the principles and practices of erosion and sediment control. The CESCL (sites one acre or more) or inspector (sites less than one acre) must have the skills to assess the:

   a. Site conditions and construction activities that could impact the quality of stormwater, and

   b. Effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

4. The SWPPP must identify the CESCL or inspector, who must be present on site or on-call at all times. The CESCL must obtain this certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (see BMP C160 in the manual referred to in Special Condition S9.C.1 and 2).

5. The Permittee must summarize the results of each inspection in an inspection report or checklist and enter the report/checklist into, or attach it to, the site log book. At a minimum, each inspection report or checklist must include:

   a. Inspection date and time.

   b. Weather information, the general conditions during inspection and the approximate amount of precipitation since the last inspection, and precipitation within the last 24 hours.

   c. A summary or list of all implemented BMPs, including observations of all erosion/sediment control structures or practices.

   d. A description of the locations:

      i. Of BMPs inspected.

      ii. Of BMPs that need maintenance and why.

      iii. Of BMPs that failed to operate as designed or intended, and

      iv. Where additional or different BMPs are needed, and why.

   e. A description of stormwater discharged from the site. The Permittee must note the presence of suspended sediment, turbidity, discoloration, and oil sheen, as applicable.

   f. Any water quality monitoring performed during inspection.

   g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made following the inspection.

   h. A summary report and a schedule of implementation of the remedial actions that the Permittee plans to take if the site inspection indicates that the site is out of compliance. The remedial actions taken must meet the requirements of the SWPPP and the permit.

   i. The name, title, and signature of the person conducting the site inspection, a phone number or other reliable method to reach this person, and the following statement: "I certify that this report is true, accurate, and complete to the best of my knowledge and belief."

C. Turbidity/Transparency Sampling Requirements

1. Sampling Methods

   a. If construction activity involves the disturbance of 5 acres or more, the Permittee must conduct turbidity sampling per Special Condition S4.C.

   b. If construction activity involves 1 acre or more but fewer than 5 acres of soil disturbance, the Permittee must conduct either transparency sampling **or** turbidity sampling per Special Condition S4.C.

2. Sampling Frequency

   a. The Permittee must sample all discharge locations at least once every calendar week when stormwater (or authorized non-stormwater) discharges from the site or enters any on-site surface waters of the state (for example, a creek running through a site).

   b. Samples must be representative of the flow and characteristics of the discharge.

   c. Sampling is not required when there is no discharge during a calendar week.

   d. Sampling is not required outside of normal working hours or during unsafe conditions.

   e. If the Permittee is unable to sample during a monitoring period, the Permittee must include a brief explanation in the monthly Discharge Monitoring Report (DMR).

   f. Sampling is not required before construction activity begins.

3. Sampling Locations

   a. Sampling is required at all points where stormwater associated with construction activity (or authorized non-stormwater) is discharged off site, including where it enters any on-site surface waters of the state (for example, a creek running through a site).

   b. The Permittee may discontinue sampling at discharge points that drain areas of the project that are fully stabilized to prevent erosion.

   c. The Permittee must identify all sampling point(s) on the SWPPP site map and clearly mark these points in the field with a flag, tape, stake or other visible marker.

   d. Sampling is not required for discharge that is sent directly to sanitary or combined sewer systems.

4. Sampling and Analysis Methods

   a. The Permittee performs turbidity analysis with a calibrated turbidity meter (turbidimeter) either on site or at an accredited lab. The Permittee must record the results in the site log book in nephelometric turbidity units (NTU).

   b. The Permittee performs transparency analysis on site with a 1¾-inch-diameter, 60-centimeter (cm)-long transparency tube. The Permittee will record the results in the site log book in centimeters (cm). Transparency tubes are available from: http://watermonitoringequip.com/pages/stream.html.

Table 4. Monitoring and Reporting Requirements

Parameter	Unit	Analytical Method	Sampling Frequency	Benchmark Value	Phone Reporting Trigger Value
Turbidity	NTU	SM2130 or EPA 180.1	Weekly, if discharging	25 NTU	250 NTU
Transparency	cm	Manufacturer instructions, or Ecology guidance	Weekly, if discharging	33 cm	6 cm

5. Turbidity/Transparency Benchmark Values and Reporting Triggers

The benchmark value for turbidity is 25 NTU or less. The benchmark value for transparency is 33 centimeters (cm). Note: Benchmark values do not apply to discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus; these discharges are subject to a numeric effluent limit for turbidity. Refer to Special Condition S8 for more information.

a. Turbidity 26 – 249 NTU, or Transparency 32 – 7 cm:

If the discharge turbidity is 26 to 249 NTU; or if discharge transparency is less than 33 cm, but equal to or greater than 6 cm, the Permittee must:

i. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.

ii. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.

iii. Document BMP implementation and maintenance in the site log book.

b. Turbidity 250 NTU or greater, or Transparency 6 cm or less:

If a discharge point's turbidity is 250 NTU or greater, or if discharge transparency is less than or equal to 6 cm, the Permittee must complete the reporting and adaptive management process described below.

i. Telephone the applicable Ecology Region's Environmental Report Tracking System (ERTS) number within 24 hours, in accordance with Special Condition S5.F.

- Central Region (Okanogan, Chelan, Douglas, Kittitas, Yakima, Klickitat, Benton): (509) 575-2490

- Eastern Region (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400
- Northwest Region (Kitsap, Snohomish, Island, King, San Juan, Skagit, Whatcom): (425) 649-7000
- Southwest Region (Grays Harbor, Lewis, Mason, Thurston, Pierce, Clark, Cowlitz, Skamania, Wahkiakum, Clallam, Jefferson, Pacific): (360) 407-6300

These numbers are also listed at the following web site: http://www.ecy.wa.gov/programs/wq/stormwater/construction/permit.html

ii. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.

iii. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.

iv. Document BMP implementation and maintenance in the site log book.

v. Continue to sample discharges daily until:

a) Turbidity is 25 NTU (or lower); or

b) Transparency is 33 cm (or greater); or

c) The Permittee has demonstrated compliance with the water quality limit for turbidity:

1) No more than 5 NTU over background turbidity, if background is less than 50 NTU, or

2) No more than 10% over background turbidity, if background is 50 NTU or greater; or

d) The discharge stops or is eliminated.

D. pH Sampling Requirements -- Significant Concrete Work or Engineered Soils

If construction activity results in the disturbance of 1 acre or more, **and** involves significant concrete work (significant concrete work means greater than 1000 cubic yards poured concrete or recycled concrete used over the life of a project) or the use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area

drains to surface waters of the State or to a storm sewer system that drains to surface waters of the state, the Permittee must conduct pH monitoring as set forth below. Note: In addition, discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for high pH are subject to a numeric effluent limit for pH; refer to Special Condition S8.

1. For sites with significant concrete work, the Permittee must begin the pH monitoring period when the concrete is first poured and exposed to precipitation, and continue weekly throughout and after the concrete pour and curing period, until stormwater pH is in the range of 6.5 to 8.5 (su).

2. For sites with engineered soils, the Permittee must begin the pH monitoring period when the soil amendments are first exposed to precipitation and must continue until the area of engineered soils is fully stabilized.

3. During the applicable pH monitoring period defined above, the Permittee must obtain a representative sample of stormwater and conduct pH analysis at least once per week.

4. The Permittee must monitor pH in the sediment trap/pond(s) or other locations that receive stormwater runoff from the area of significant concrete work or engineered soils before the stormwater discharges to surface waters.

5. The benchmark value for pH is 8.5 standard units. Anytime sampling indicates that pH is 8.5 or greater, the Permittee must either:

   a. Prevent the high pH water (8.5 or above) from entering storm sewer systems or surface waters; or

   b. If necessary, adjust or neutralize the high pH water until it is in the range of pH 6.5 to 8.5 (su) using an appropriate treatment BMP such as carbon dioxide (CO_2) sparging or dry ice. The Permittee must obtain written approval from Ecology before using any form of chemical treatment other than CO_2 sparging or dry ice.

6. The Permittee must perform pH analysis on site with a calibrated pH meter, pH test kit, or wide range pH indicator paper. The Permittee must record pH monitoring results in the site log book.

S5. REPORTING AND RECORDKEEPING REQUIREMENTS

A. High Turbidity Phone Reporting

Anytime sampling performed in accordance with Special Condition S4.C indicates turbidity has reached the 250 NTU phone reporting level, the Permittee must call Ecology's Regional office by phone within 24 hours of analysis. The web site is http://www.ecy.wa.gov/programs/wq/stormwater/construction/permit.html. Also see phone numbers in Special Condition S4.C.5.b.i.

B. Discharge Monitoring Reports

Permittees required to conduct water quality sampling in accordance with Special Conditions S4.C (Turbidity/Transparency), S4.D (pH), S8 (303[d]/TMDL sampling), and/or G13 (Additional Sampling) must submit the results to Ecology.

Permittees must submit monitoring data using Ecology's WebDMR program. To find out more information and to sign up for WebDMR go to: http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html.

Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper copy DMR at:

Mailing Address:
Department of Ecology
Water Quality Program
Attn: Stormwater Compliance Specialist
PO Box 47696
Olympia, WA 98504-7696

Permittees who obtain a waiver not to use WebDMR must use the forms provided to them by Ecology; submittals must be mailed to the address above. Permittees shall submit DMR forms to be received by Ecology within 15 days following the end of each month.

If there was no discharge during a given monitoring period, all Permittees must submit a DMR as required with "no discharge" entered in place of the monitoring results. For more information, contact Ecology staff using information provided at the following web site: http://www.ecy.wa.gov/programs/spills/response/assistancesoil%20map.pdf

C. Records Retention

The Permittee must retain records of all monitoring information (site log book, sampling results, inspection reports/checklists, etc.), Stormwater Pollution Prevention Plan, and any other documentation of compliance with permit requirements for the entire life of the construction project and for a minimum of three years following the termination of permit coverage. Such information must include all calibration and maintenance records, and records of all data used to complete the application for this

permit. This period of retention must be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

D. Recording Results

For each measurement or sample taken, the Permittee must record the following information:

1. Date, place, method, and time of sampling or measurement.
2. The first and last name of the individual who performed the sampling or measurement.
3. The date(s) the analyses were performed.
4. The first and last name of the individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all analyses.

E. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by this permit using test procedures specified by Special Condition S4 of this permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the Permittee's DMR.

F. Noncompliance Notification

In the event the Permittee is unable to comply with any part of the terms and conditions of this permit, and the resulting noncompliance may cause a threat to human health or the environment, the Permittee must:

1. Immediately notify Ecology of the failure to comply by calling the applicable Regional office ERTS phone number (find at http://www.ecy.wa.gov/programs/spills/response/assistancesoil%20map.pdf) or refer to Special Condition S4.C.5.b.i.
2. Immediately take action to prevent the discharge/pollution, or otherwise stop or correct the noncompliance, and, if applicable, repeat sampling and analysis of any noncompliance immediately and submit the results to Ecology within five (5) days of becoming aware of the violation.
3. Submit a detailed written report to Ecology within five (5) days, unless requested earlier by Ecology. The report must contain a description of the noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The Permittee must report any unanticipated bypass and/or upset that exceeds any effluent limit in the permit in accordance with the 24-hour reporting requirement contained in 40 C.F.R. 122.41(l)(6)).

Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply. Refer to Section G14 of this permit for specific information regarding non-compliance.

G. Access to Plans and Records

1. The Permittee must retain the following permit documentation (plans and records) on site, or within reasonable access to the site, for use by the operator or for on-site review by Ecology or the local jurisdiction:

   a. General Permit.

   b. Permit Coverage Letter.

   c. Stormwater Pollution Prevention Plan (SWPPP).

   d. Site Log Book.

2. The Permittee must address written requests for plans and records listed above (Special Condition S5.G.1) as follows:

   a. The Permittee must provide a copy of plans and records to Ecology within 14 days of receipt of a written request from Ecology.

   b. The Permittee must provide a copy of plans and records to the public when requested in writing. Upon receiving a written request from the public for the Permittee's plans and records, the Permittee must either:

      i. Provide a copy of the plans and records to the requester within 14 days of a receipt of the written request; or

      ii. Notify the requester within 10 days of receipt of the written request of the location and times within normal business hours when the plans and records may be viewed; and provide access to the plans and records within 14 days of receipt of the written request; or

      Within 14 days of receipt of the written request, the Permittee may submit a copy of the plans and records to Ecology for viewing and/or copying by the requester at an Ecology office, or a mutually agreed location. If plans and records are viewed and/or copied at a location other than at an Ecology office, the Permittee will provide reasonable access to copying services for which a reasonable fee may be charged. The Permittee must notify the requester within 10 days of receipt of the request where the plans and records may be viewed and/or copied.

S6. PERMIT FEES

The Permittee must pay permit fees assessed by Ecology. Fees for stormwater discharges covered under this permit are established by Chapter 173-224 WAC. Ecology continues to assess permit fees until the permit is terminated in accordance with Special Condition S10 or revoked in accordance with General Condition G5.

S7. SOLID AND LIQUID WASTE DISPOSAL

The Permittee must handle and dispose of solid and liquid wastes generated by construction activity, such as demolition debris, construction materials, contaminated materials, and waste materials from maintenance activities, including liquids and solids from cleaning catch basins and other stormwater facilities, in accordance with:

A. Special Condition S3, Compliance with Standards.

B. WAC 173-216-110.

C. Other applicable regulations.

S8. DISCHARGES TO 303(D) OR TMDL WATER BODIES

A. Sampling and Numeric Effluent Limits For Certain Discharges to 303(d)-listed Water Bodies

1. Permittees who discharge to segments of water bodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH, or phosphorus, must conduct water quality sampling according to the requirements of this section, and Special Conditions S4.C.2.b-f and S4.C.3.b-d, and must comply with the applicable numeric effluent limitations in S8.C and S8.D.

2. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current listing by Ecology of impaired waters (Category 5) that exists on January 1, 2011, or the date when the operator's complete permit application is received by Ecology, whichever is later.

B. Limits on Coverage for New Discharges to TMDL or 303(d)-listed Waters

Operators of construction sites that discharge to a 303(d)-listed water body are not eligible for coverage under this permit *unless* the operator:

1. Prevents exposing stormwater to pollutants for which the water body is impaired, and retains documentation in the SWPPP that details procedures taken to prevent exposure on site; or

2. Documents that the pollutants for which the water body is impaired are not present at the site, and retains documentation of this finding within the SWPPP; or

3. Provides Ecology with data indicating the discharge is not expected to cause or contribute to an exceedance of a water quality standard, and retains such data on site with the SWPPP. The operator must provide data and other technical information to Ecology that sufficiently demonstrate:

   a. For discharges to waters without an EPA-approved or -established TMDL, that the discharge of the pollutant for which the water is impaired will meet in-stream water quality criteria at the point of discharge to the water body; or

   b. For discharges to waters with an EPA-approved or -established TMDL, that there is sufficient remaining wasteload allocation in the TMDL to allow construction stormwater discharge and that existing dischargers to the water body are subject to compliance schedules designed to bring the water body into attainment with water quality standards.

   Operators of construction sites are eligible for coverage under this permit if Ecology issues permit coverage based upon an affirmative determination that the discharge will not cause or contribute to the existing impairment.

C. Sampling and Numeric Effluent Limits for Discharges to Water Bodies on the 303(d) List for Turbidity, Fine Sediment, or Phosphorus

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus must conduct turbidity sampling in accordance with Special Condition S4.C.2 and comply with either of the numeric effluent limits noted in Table 5 below.

2. As an alternative to the 25 NTU effluent limit noted in Table 5 below (applied at the point where stormwater [or authorized non-stormwater] is discharged off-site), permittees may choose to comply with the surface water quality standard for turbidity. The standard is: no more than 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or no more than a 10% increase in turbidity when the background turbidity is more than 50 NTU. In order to use the water quality standard requirement, the sampling must take place at the following locations:

   a. Background turbidity in the 303(d)-listed receiving water immediately upstream (upgradient) or outside the area of influence of the discharge.

   b. Turbidity at the point of discharge into the 303(d)-listed receiving water, inside the area of influence of the discharge.

3. Discharges that exceed the numeric effluent limit for turbidity constitute a violation of this permit.

4. Permittees whose discharges exceed the numeric effluent limit shall sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

Table 5. Turbidity, Fine Sediment & Phosphorus Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled	Unit	Analytical Method	Sampling Frequency	Numeric Effluent Limit[1]
• Turbidity • Fine Sediment • Phosphorus	Turbidity	NTU	SM2130 or EPA180.1	Weekly, if discharging	25 NTU, at the point where stormwater is discharged from the site; OR In compliance with the surface water quality standard for turbidity (S8.C.1.a)

[1]Permittees subject to a numeric effluent limit for turbidity may, at their discretion, choose either numeric effluent limitation based on site-specific considerations including, but not limited to, safety, access and convenience.

D. Discharges to Water Bodies on the 303(d) List for High pH

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for high pH must conduct pH sampling in accordance with the table below, and comply with the numeric effluent limit of pH 6.5 to 8.5 su (Table 6).

Table 6. pH Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled/Units	Analytical Method	Sampling Frequency	Numeric Effluent Limit
High pH	pH /Standard Units	pH meter	Weekly, if discharging	In the range of 6.5 – 8.5

2. At the Permittee's discretion, compliance with the limit shall be assessed at one of the following locations:

   a. Directly in the 303(d)-listed water body segment, inside the immediate area of influence of the discharge; or

   b. Alternatively, the permittee may measure pH at the point where the discharge leaves the construction site, rather than in the receiving water.

3. Discharges that exceed the numeric effluent limit for pH (outside the range of 6.5 – 8.5 su) constitute a violation of this permit.

4. Permittees whose discharges exceed the numeric effluent limit shall sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

E. Sampling and Limits for Sites Discharging to Waters Covered by a TMDL or Another Pollution Control Plan

1. Discharges to a water body that is subject to a Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus must be consistent with the TMDL. Refer to http://www.ecy.wa.gov/programs/wq/tmdl/index.html for more information on TMDLs.

    a. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges must be consistent with any specific waste load allocations or requirements established by the applicable TMDL.

        i. The Permittee must sample discharges weekly or as otherwise specified by the TMDL to evaluate compliance with the specific waste load allocations or requirements.

        ii. Analytical methods used to meet the monitoring requirements must conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136. Turbidity and pH methods need not be accredited or registered unless conducted at a laboratory which must otherwise be accredited or registered.

    b. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but has not identified specific requirements, compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL.

    c. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL.

    d. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

2. Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus that is completed and approved by EPA before January 1, 2011, or before the date the operator's complete permit application is received by Ecology, whichever is later. TMDLs completed after the operator's complete permit application is received by Ecology become applicable to the Permittee only if they are imposed through an administrative order by Ecology, or through a modification of permit coverage.

S9. STORMWATER POLLUTION PREVENTION PLAN

The Permittee must prepare and properly implement an adequate Stormwater Pollution Prevention Plan (SWPPP) for construction activity in accordance with the requirements of this permit beginning with initial soil disturbance and until final stabilization.

A. The Permittee's SWPPP must meet the following objectives:

1. To implement best management practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. To prevent violations of surface water quality, ground water quality, or sediment management standards.

3. To control peak volumetric flow rates and velocities of stormwater discharges.

B. General Requirements

1. The SWPPP must include a narrative and drawings. All BMPs must be clearly referenced in the narrative and marked on the drawings. The SWPPP narrative must include documentation to explain and justify the pollution prevention decisions made for the project. Documentation must include:

   a. Information about existing site conditions (topography, drainage, soils, vegetation, etc.).

   b. Potential erosion problem areas.

   c. The 12 elements of a SWPPP in Special Condition S9.D.1-12, including BMPs used to address each element.

   d. Construction phasing/sequence and general BMP implementation schedule.

   e. The actions to be taken if BMP performance goals are not achieved—for example, a contingency plan for additional treatment and/or storage of stormwater that would violate the water quality standards if discharged.

   f. Engineering calculations for ponds and any other designed structures.

2. The Permittee must modify the SWPPP if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is, or would be, ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The Permittee must then:

   a. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the inspection or investigation.

   b. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than 10 days from the inspection or investigation. If

installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period,

c. Document BMP implementation and maintenance in the site log book.

The Permittee must modify the SWPPP whenever there is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

C. Stormwater Best Management Practices (BMPs)

BMPs must be consistent with:

1. Stormwater Management Manual for Western Washington (most recent edition), for sites west of the crest of the Cascade Mountains; or

2. Stormwater Management Manual for Eastern Washington (most recent edition), for sites east of the crest of the Cascade Mountains; or

3. Revisions to the manuals listed in Special Condition S9.C.1. & 2., or other stormwater management guidance documents or manuals which provide an equivalent level of pollution prevention, that are approved by Ecology and incorporated into this permit in accordance with the permit modification requirements of WAC 173-226-230; or

4. Documentation in the SWPPP that the BMPs selected provide an equivalent level of pollution prevention, compared to the applicable Stormwater Management Manuals, including:

   a. The technical basis for the selection of all stormwater BMPs (scientific, technical studies, and/or modeling) that support the performance claims for the BMPs being selected.

   b. An assessment of how the selected BMP will satisfy AKART requirements and the applicable federal technology-based treatment requirements under 40 CFR part 125.3.

D. SWPPP – Narrative Contents and Requirements

The Permittee must include each of the 12 elements below in Special Condition S9.D.1-12 in the narrative of the SWPPP and implement them unless site conditions render the element unnecessary and the exemption from that element is clearly justified in the SWPPP.

1. Preserve Vegetation/Mark Clearing Limits

   a. Before beginning land-disturbing activities, including clearing and grading, clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.

b. Retain the duff layer, native top soil, and natural vegetation in an undisturbed state to the maximum degree practicable.

2. Establish Construction Access

   a. Limit construction vehicle access and exit to one route, if possible.

   b. Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize tracking sediment onto roads.

   c. Locate wheel wash or tire baths on site, if the stabilized construction entrance is not effective in preventing tracking sediment onto roads.

   d. If sediment is tracked off site, clean the affected roadway thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or pickup and transport of the sediment to a controlled sediment disposal area.

   e. Conduct street washing only after sediment removal in accordance with Special Condition S9.D.2.d. Control street wash wastewater by pumping back on site or otherwise preventing it from discharging into systems tributary to waters of the State.

3. Control Flow Rates

   a. Protect properties and waterways downstream of development sites from erosion and the associated discharge of turbid waters due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site, as required by local plan approval authority.

   b. Where necessary to comply with Special Condition S9.D.3.a, construct stormwater retention or detention facilities as one of the first steps in grading. Assure that detention facilities function properly before constructing site improvements (for example, impervious surfaces).

   c. If permanent infiltration ponds are used for flow control during construction, protect these facilities from siltation during the construction phase.

4. Install Sediment Controls

   The Permittee must design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, the Permittee must design, install and maintain such controls to:

   a. Construct sediment control BMPs (sediment ponds, traps, filters, etc.) as one of the first steps in grading. These BMPs must be functional before other land disturbing activities take place.

   b. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of

resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.

c. Direct stormwater runoff from disturbed areas through a sediment pond or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must meet the flow control performance standard of Special Condition S9.D.3.a.

d. Locate BMPs intended to trap sediment on site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.

e. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible.

f. Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

5. Stabilize Soils

a. The Permittee must stabilize exposed and unworked soils by application of effective BMPs that prevent erosion. Applicable BMPs include, but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion control fabrics and matting, soil application of polyacrylamide (PAM), the early application of gravel base on areas to be paved, and dust control.

b. The Permittee must control stormwater volume and velocity within the site to minimize soil erosion.

c. The Permittee must control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion.

d. Depending on the geographic location of the project, the Permittee must not allow soils to remain exposed and unworked for more than the time periods set forth below to prevent erosion:

West of the Cascade Mountains Crest
During the dry season (May 1 - Sept. 30): 7 days
During the wet season (October 1 - April 30): 2 days

East of the Cascade Mountains Crest, except for Central Basin*
During the dry season (July 1 - September 30): 10 days
During the wet season (October 1 - June 30): 5 days

The Central Basin*, East of the Cascade Mountains Crest

During the dry Season (July 1 - September 30): 30 days
During the wet season (October 1 - June 30): 15 days

*Note: The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches.

e. The Permittee must stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.

f. The Permittee must stabilize soil stockpiles from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

g. The Permittee must minimize the amount of soil exposed during construction activity.

h. The Permittee must minimize the disturbance of steep slopes.

i. The Permittee must minimize soil compaction and, unless infeasible, preserve topsoil.

6. Protect Slopes

a. The Permittee must design and construct cut-and-fill slopes in a manner to minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (for example, track walking).

b. The Permittee must divert off-site stormwater (run-on) or ground water away from slopes and disturbed areas with interceptor dikes, pipes, and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.

c. At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.

i. West of the Cascade Mountains Crest: Temporary pipe slope drains must handle the peak 10-minute velocity of flow from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas should be modeled as "landscaped area."

ii. East of the Cascade Mountains Crest: Temporary pipe slope drains must handle the expected peak flow velocity from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.

d. Place excavated material on the uphill side of trenches, consistent with safety and space considerations.

e. Place check dams at regular intervals within constructed channels that are cut down a slope.

7. Protect Drain Inlets

a. Protect all storm drain inlets made operable during construction so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.

b. Clean or remove and replace inlet protection devices when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

8. Stabilize Channels and Outlets

a. Design, construct and stabilize all on-site conveyance channels to prevent erosion from the following expected peak flows:

i. West of the Cascade Mountains Crest: Channels must handle the peak 10-minute velocity of flow from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate indicated by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the WWHM to predict flows, bare soil areas should be modeled as "landscaped area."

ii. East of the Cascade Mountains Crest: Channels must handle the expected peak flow velocity from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.

b. Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches at the outlets of all conveyance systems.

9. Control Pollutants

Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants. The Permittee must:

a. Handle and dispose of all pollutants, including waste materials and demolition debris that occur on site in a manner that does not cause contamination of stormwater.

b. Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. On-site fueling tanks must include secondary containment. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume contained in the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment.

c. Conduct maintenance, fueling, and repair of heavy equipment and vehicles using spill prevention and control measures. Clean contaminated surfaces immediately following any spill incident.

d. Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland land application, or to the sanitary sewer with local sewer district approval.

e. Apply fertilizers and pesticides in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers' label requirements for application rates and procedures.

f. Use BMPs to prevent contamination of stormwater runoff by pH-modifying sources. The sources for this contamination include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout waters. (Also refer to the definition for "concrete wastewater" in Appendix A--Definitions.)

g. Adjust the pH of stormwater if necessary to prevent violations of water quality standards.

h. Assure that washout of concrete trucks is performed offsite or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Do not dump excess concrete on site, except in designated concrete washout areas. Concrete spillage or concrete discharge to surface waters of the State is prohibited.

i. Obtain written approval from Ecology before using chemical treatment other than CO_2 or dry ice to adjust pH.

10. Control Dewatering

a. Permittees must discharge foundation, vault, and trench dewatering water, which have characteristics similar to stormwater runoff at the site, into a

controlled conveyance system before discharge to a sediment trap or sediment pond.

b. Permittees may discharge clean, non-turbid dewatering water, such as well-point ground water, to systems tributary to, or directly into surface waters of the State, as specified in Special Condition S9.D.8, provided the dewatering flow does not cause erosion or flooding of receiving waters. Do not route clean dewatering water through stormwater sediment ponds. Note that "surface waters of the State" may exist on a construction site as well as off site; for example, a creek running through a site.

c. Other treatment or disposal options may include:

   i. Infiltration.

   ii. Transport off site in a vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters.

   iii. Ecology-approved on-site chemical treatment or other suitable treatment technologies.

   iv. Sanitary or combined sewer discharge with local sewer district approval, if there is no other option.

   v. Use of a sedimentation bag with discharge to a ditch or swale for small volumes of localized dewatering.

d. Permittees must handle highly turbid or contaminated dewatering water separately from stormwater.

11. Maintain BMPs

    a. Permittees must maintain and repair all temporary and permanent erosion and sediment control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.

    b. Permittees must remove all temporary erosion and sediment control BMPs within 30 days after achieving final site stabilization or after the temporary BMPs are no longer needed.

12. Manage the Project

    a. Phase development projects to the maximum degree practicable and take into account seasonal work limitations.

    b. Inspection and monitoring -- Inspect, maintain and repair all BMPs as needed to assure continued performance of their intended function. Conduct site inspections and monitoring in accordance with Special Condition S4.

    c. Maintaining an updated construction SWPPP -- Maintain, update, and implement the SWPPP in accordance with Special Conditions S3, S4 and S9.

E. SWPPP – Map Contents and Requirements

The Permittee's SWPPP must also include a vicinity map or general location map (for example, a USGS quadrangle map, a portion of a county or city map, or other appropriate map) with enough detail to identify the location of the construction site and receiving waters within one mile of the site.

The SWPPP must also include a legible site map (or maps) showing the entire construction site. The following features must be identified, unless not applicable due to site conditions:

1. The direction of north, property lines, and existing structures and roads.
2. Cut and fill slopes indicating the top and bottom of slope catch lines.
3. Approximate slopes, contours, and direction of stormwater flow before and after major grading activities.
4. Areas of soil disturbance and areas that will not be disturbed.
5. Locations of structural and nonstructural controls (BMPs) identified in the SWPPP.
6. Locations of off-site material, stockpiles, waste storage, borrow areas, and vehicle/equipment storage areas.
7. Locations of all surface water bodies, including wetlands.
8. Locations where stormwater or non-stormwater discharges off-site and/or to a surface water body, including wetlands.
9. Location of water quality sampling station(s), if sampling is required by state or local permitting authority.
10. Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.

S10. NOTICE OF TERMINATION

A. The site is eligible for termination of coverage when it has met any of the following conditions:

1. The site has undergone final stabilization, the Permittee has removed all temporary BMPs (except biodegradable BMPs clearly manufactured with the intention for the material to be left in place and not interfere with maintenance or land use), and all stormwater discharges associated with construction activity have been eliminated; or
2. All portions of the site that have not undergone final stabilization per Special Condition S10.A.1 have been sold and/or transferred (per General Condition G9), and the Permittee no longer has operational control of the construction activity; or

3. For residential construction only, the Permittee has completed temporary stabilization and the homeowners have taken possession of the residences.

B. When the site is eligible for termination, the Permittee must submit a complete and accurate Notice of Termination (NOT) form, signed in accordance with General Condition G2, to:

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, Washington 98504-7696

The termination is effective on the date Ecology receives the NOT form, unless Ecology notifies the Permittee within 30 days that termination request is denied because the Permittee has not met the eligibility requirements in Special Condition S10.A.

Permittees transferring the property to a new property owner or operator/permittee are required to complete and submit the Notice of Transfer form to Ecology, but are not required to submit a Notice of Termination form for this type of transaction.

GENERAL CONDITIONS

G1. DISCHARGE VIOLATIONS

All discharges and activities authorized by this general permit must be consistent with the terms and conditions of this general permit. Any discharge of any pollutant more frequent than or at a level in excess of that identified and authorized by the general permit must constitute a violation of the terms and conditions of this permit.

G2. SIGNATORY REQUIREMENTS

A. All permit applications must bear a certification of correctness to be signed:

1. In the case of corporations, by a responsible corporate officer of at least the level of vice president of a corporation;

2. In the case of a partnership, by a general partner of a partnership;

3. In the case of sole proprietorship, by the proprietor; or

4. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

B. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to the Ecology.

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

C. Changes to authorization. If an authorization under paragraph G2.B.2 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph G2.B.2 above must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a document under this section must make the following certification:

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering

information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G3. RIGHT OF INSPECTION AND ENTRY

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

A. To enter upon the premises where a discharge is located or where any records are kept under the terms and conditions of this permit.

B. To have access to and copy – at reasonable times and at reasonable cost -- any records required to be kept under the terms and conditions of this permit.

C. To inspect -- at reasonable times – any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.

D. To sample or monitor – at reasonable times – any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G4. GENERAL PERMIT MODIFICATION AND REVOCATION

This permit may be modified, revoked and reissued, or terminated in accordance with the provisions of Chapter 173-226 WAC. Grounds for modification, revocation and reissuance, or termination include, but are not limited to, the following:

A. When a change occurs in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this permit.

B. When effluent limitation guidelines or standards are promulgated pursuant to the CWA or Chapter 90.48 RCW, for the category of dischargers covered under this permit.

C. When a water quality management plan containing requirements applicable to the category of dischargers covered under this permit is approved, or

D. When information is obtained that indicates cumulative effects on the environment from dischargers covered under this permit are unacceptable.

G5. REVOCATION OF COVERAGE UNDER THE PERMIT

Pursuant to Chapter 43.21B RCW and Chapter 173-226 WAC, the Director may terminate coverage for any discharger under this permit for cause. Cases where coverage may be terminated include, but are not limited to, the following:

A. Violation of any term or condition of this permit.

B. Obtaining coverage under this permit by misrepresentation or failure to disclose fully all relevant facts.

C. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

D. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.

E. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations.

F. Nonpayment of permit fees or penalties assessed pursuant to RCW 90.48.465 and Chapter 173-224 WAC.

G. Failure of the Permittee to satisfy the public notice requirements of WAC 173-226-130(5), when applicable.

The Director may require any discharger under this permit to apply for and obtain coverage under an individual permit or another more specific general permit. Permittees who have their coverage revoked for cause according to WAC 173-226-240 may request temporary coverage under this permit during the time an individual permit is being developed, provided the request is made within ninety (90) days from the time of revocation and is submitted along with a complete individual permit application form.

G6. REPORTING A CAUSE FOR MODIFICATION

The Permittee must submit a new application, or a supplement to the previous application, whenever a material change to the construction activity or in the quantity or type of discharge is anticipated which is not specifically authorized by this permit. This application must be submitted at least sixty (60) days prior to any proposed changes. Filing a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.

G7. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit will be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G8. DUTY TO REAPPLY

The Permittee must apply for permit renewal at least 180 days prior to the specified expiration date of this permit.

G9. TRANSFER OF GENERAL PERMIT COVERAGE

Coverage under this general permit is automatically transferred to a new discharger, including operators of lots/parcels within a common plan of development or sale, **if**:

A. A written agreement (Transfer of Coverage Form) between the current discharger (Permittee) and new discharger, signed by both parties and containing a specific date for transfer of permit responsibility, coverage, and liability is submitted to the Director; and

B. The Director does not notify the current discharger and new discharger of the Director's intent to revoke coverage under the general permit. If this notice is not given, the transfer is effective on the date specified in the written agreement.

When a current discharger (Permittee) transfers a portion of a permitted site, the current discharger must also submit an updated application form (NOI) to the Director indicating the remaining permitted acreage after the transfer.

G10. REMOVED SUBSTANCES

The Permittee must not re-suspend or reintroduce collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of stormwater to the final effluent stream for discharge to state waters.

G11. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology, within a reasonable time, all information that Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology, upon request, copies of records required to be kept by this permit [40 CFR 122.41(h)].

G12. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G13. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G14. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit shall be deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to ten thousand dollars ($10,000) and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit shall incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars ($10,000) for every such violation. Each and every such violation shall be a separate and distinct offense, and in case of a continuing violation, every day's continuance shall be deemed to be a separate and distinct violation.

G15. UPSET

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that: 1) an upset occurred and that the Permittee can identify the cause(s) of the upset; 2) the permitted facility was being properly operated at the time of the upset; 3) the Permittee submitted notice of the upset as required in Special Condition S5.F, and; 4) the Permittee complied with any remedial measures required under this permit.

In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. DUTY TO COMPLY

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G18. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment shall be a fine of not more than $20,000 per day of violation, or imprisonment of not more than four (4) years, or both.

G20. REPORTING PLANNED CHANGES

The Permittee must, as soon as possible, give notice to Ecology of planned physical alterations, modifications or additions to the permitted construction activity. The Permittee should be aware that, depending on the nature and size of the changes to the original permit, a new public notice and other permit process requirements may be required. Changes in activities that require reporting to Ecology include those that will result in:

A. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).

B. A significant change in the nature or an increase in quantity of pollutants discharged, including but not limited to: for sites 5 acres or larger, a 20% or greater increase in acreage disturbed by construction activity.

C. A change in or addition of surface water(s) receiving stormwater or non-stormwater from the construction activity.

D. A change in the construction plans and/or activity that affects the Permittee's monitoring requirements in Special Condition S4.

Following such notice, permit coverage may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G21. REPORTING OTHER INFORMATION

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to Ecology, it must promptly submit such facts or information.

G22. REPORTING ANTICIPATED NON-COMPLIANCE

The Permittee must give advance notice to Ecology by submission of a new application or supplement thereto at least forty-five (45) days prior to commencement of such discharges, of any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility or activity which may result in noncompliance with permit limits or conditions. Any maintenance of facilities, which might necessitate unavoidable interruption of operation and degradation of effluent quality, must be scheduled during non-critical water quality periods and carried out in a manner approved by Ecology.

G23. REQUESTS TO BE EXCLUDED FROM COVERAGE UNDER THE PERMIT

Any discharger authorized by this permit may request to be excluded from coverage under the general permit by applying for an individual permit. The discharger must submit to the Director an application as described in WAC 173-220-040 or WAC 173-216-070, whichever is applicable, with reasons supporting the request. These reasons will fully document how an individual permit will apply to the applicant in a way that the general permit cannot. Ecology may make specific requests for information to support the request. The Director will either issue an individual permit or deny the request with a statement explaining the reason for the denial. When an individual permit is issued to a discharger otherwise subject to the construction stormwater general permit, the applicability of the construction stormwater general permit to that Permittee is automatically terminated on the effective date of the individual permit.

G24. APPEALS

A. The terms and conditions of this general permit, as they apply to the appropriate class of dischargers, are subject to appeal by any person within 30 days of issuance of this general permit, in accordance with Chapter 43.21B RCW, and Chapter 173-226 WAC.

B. The terms and conditions of this general permit, as they apply to an individual discharger, are appealable in accordance with Chapter 43.21B RCW within 30 days of the effective date of coverage of that discharger. Consideration of an appeal of general permit coverage of an individual discharger is limited to the general permit's applicability or nonapplicability to that individual discharger.

C. The appeal of general permit coverage of an individual discharger does not affect any other dischargers covered under this general permit. If the terms and conditions of this general permit are found to be inapplicable to any individual discharger(s), the matter

shall be remanded to Ecology for consideration of issuance of an individual permit or permits.

G25. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

G26. BYPASS PROHIBITED

A. Bypass Procedures

Bypass, which is the intentional diversion of waste streams from any portion of a treatment facility, is prohibited for stormwater events below the design criteria for stormwater management. Ecology may take enforcement action against a Permittee for bypass unless one of the following circumstances (1, 2, 3 or 4) is applicable.

1. Bypass of stormwater is consistent with the design criteria and part of an approved management practice in the applicable stormwater management manual.

2. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

   Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limitations or other conditions of this permit, or adversely impact public health.

3. Bypass of stormwater is unavoidable, unanticipated, and results in noncompliance of this permit.

   This bypass is permitted only if:

   a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.

   b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility.

c. Ecology is properly notified of the bypass as required in Special Condition S5.F of this permit.

4. A planned action that would cause bypass of stormwater and has the potential to result in noncompliance of this permit during a storm event.

   The Permittee must notify Ecology at least thirty (30) days before the planned date of bypass. The notice must contain:

   a. a description of the bypass and its cause

   b. an analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing.

   c. a cost-effectiveness analysis of alternatives including comparative resource damage assessment.

   d. the minimum and maximum duration of bypass under each alternative.

   e. a recommendation as to the preferred alternative for conducting the bypass.

   f. the projected date of bypass initiation.

   g. a statement of compliance with SEPA.

   h. a request for modification of water quality standards as provided for in WAC 173-201A-110, if an exceedance of any water quality standard is anticipated.

   i. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

5. For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. The analysis required above must be considered during preparation of the Stormwater Pollution Prevention Plan (SWPPP) and must be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass.

   Ecology will consider the following before issuing an administrative order for this type bypass:

   a. If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.

   b. If there are feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.

   c. If the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve, conditionally approve, or deny the request. The public must be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by Ecology under RCW 90.48.120.

B. Duty to Mitigate

The Permittee is required to take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

APPENDIX A – DEFINITIONS

AKART is an acronym for "all known, available, and reasonable methods of prevention, control, and treatment." AKART represents the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants and controlling pollution associated with a discharge.

Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which was completed and approved by EPA before January 1, 2011, or before the date the operator's complete permit application is received by Ecology, whichever is later.

Applicant means an operator seeking coverage under this permit.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: stormwater associated with construction activity, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Buffer means an area designated by a local jurisdiction that is contiguous to and intended to protect a sensitive area.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

Calendar Day A period of 24 consecutive hours starting at 12:00 midnight and ending the following 12:00 midnight.

Calendar Week (same as Week) means a period of seven consecutive days starting at 12:01 a.m. (0:01 hours) on Sunday.

Certified Erosion and Sediment Control Lead (CESCL) means a person who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (see BMP C160 in the SWMM).

Clean Water Act (CWA) means the Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, and 97-117; USC 1251 et seq.

Combined Sewer means a sewer which has been designed to serve as a sanitary sewer and a storm sewer, and into which inflow is allowed by local ordinance.

Common Plan of Development or Sale means a site where multiple separate and distinct construction activities may be taking place at different times on different schedules and/or by different contractors, but still under a single plan. Examples include: 1) phased projects and projects with multiple filings or lots, even if the separate phases or filings/lots will be constructed under separate contract or by separate owners (e.g., a development where lots are sold to separate builders); 2) a development plan that may be phased over multiple years, but is still under a

consistent plan for long-term development; 3) projects in a contiguous area that may be unrelated but still under the same contract, such as construction of a building extension and a new parking lot at the same facility; and 4) linear projects such as roads, pipelines, or utilities. If the project is part of a common plan of development or sale, the disturbed area of the entire plan must be used in determining permit requirements.

Composite Sample means a mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increases while maintaining a constant time interval between the aliquots.

Concrete wastewater means any water used in the production, pouring and/or clean-up of concrete or concrete products, and any water used to cut, grind, wash, or otherwise modify concrete or concrete products. Examples include water used for or resulting from concrete truck/mixer/pumper/tool/chute rinsing or washing, concrete saw cutting and surfacing (sawing, coring, grinding, roughening, hydro-demolition, bridge and road surfacing). When stormwater comingles with concrete wastewater, the resulting water is considered concrete wastewater and must be managed to prevent discharge to waters of the state, including ground water.

Construction Activity means land disturbing operations including clearing, grading or excavation which disturbs the surface of the land. Such activities may include road construction, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Contaminant means any hazardous substance that does not occur naturally or occurs at greater than natural background levels. See definition of "hazardous substance" and WAC 173-340-200.

Demonstrably Equivalent means that the technical basis for the selection of all stormwater BMPs is documented within a SWPPP, including:

1. The method and reasons for choosing the stormwater BMPs selected.
2. The pollutant removal performance expected from the BMPs selected.
3. The technical basis supporting the performance claims for the BMPs selected, including any available data concerning field performance of the BMPs selected.
4. An assessment of how the selected BMPs will comply with state water quality standards.
5. An assessment of how the selected BMPs will satisfy both applicable federal technology-based treatment requirements and state requirements to use all known, available, and reasonable methods of prevention, control, and treatment (AKART).

Department means the Washington State Department of Ecology.

Detention means the temporary storage of stormwater to improve quality and/or to reduce the mass flow rate of discharge.

Dewatering means the act of pumping ground water or stormwater away from an active construction site.

Director means the Director of the Washington Department of Ecology or his/her authorized representative.

Discharger means an owner or operator of any facility or activity subject to regulation under Chapter 90.48 RCW or the Federal Clean Water Act.

Domestic Wastewater means water carrying human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments, or other places, together with such ground water infiltration or surface waters as may be present.

Ecology means the Washington State Department of Ecology.

Engineered Soils means the use of soil amendments including, but not limited, to Portland cement treated base (CTB), cement kiln dust (CKD), or fly ash to achieve certain desirable soil characteristics.

Equivalent BMPs means operational, source control, treatment, or innovative BMPs which result in equal or better quality of stormwater discharge to surface water or to ground water than BMPs selected from the SWMM.

Erosion means the wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep.

Erosion and Sediment Control BMPs means BMPs intended to prevent erosion and sedimentation, such as preserving natural vegetation, seeding, mulching and matting, plastic covering, filter fences, sediment traps, and ponds. Erosion and sediment control BMPs are synonymous with stabilization and structural BMPs.

Final Stabilization (same as fully stabilized or full stabilization) means the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as riprap, gabions or geotextiles) which prevents erosion.

Ground Water means water in a saturated zone or stratum beneath the land surface or a surface water body.

Hazardous Substance means any dangerous or extremely hazardous waste as defined in RCW 70.105.010 (5) and (6), or any dangerous or extremely dangerous waste as designated by rule under chapter 70.105 RCW; any hazardous sub-stance as defined in RCW 70.105.010(14) or any hazardous substance as defined by rule under chapter 70.105 RCW; any substance that, on the effective date of this section, is a hazardous substance under section 101(14) of the federal cleanup law, 42 U.S.C., Sec. 9601(14); petroleum or petroleum products; and any substance or category of substances, including solid waste decomposition products, determined by the director

by rule to present a threat to human health or the environment if released into the environment. The term hazardous substance does not include any of the following when contained in an underground storage tank from which there is not a release: crude oil or any fraction thereof or petroleum, if the tank is in compliance with all applicable federal, state, and local law.

Injection Well means a well that is used for the subsurface emplacement of fluids. (See Well.)

Jurisdiction means a political unit such as a city, town or county; incorporated for local self-government.

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the State from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington Department of Ecology.

Notice of Intent (NOI) means the application for, or a request for coverage under this general permit pursuant to WAC 173-226-200.

Notice of Termination (NOT) means a request for termination of coverage under this general permit as specified by Special Condition S10 of this permit.

Operator means any party associated with a construction project that meets either of the following two criteria:

- The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

Permittee means individual or entity that receives notice of coverage under this general permit.

pH means a liquid's measure of acidity or alkalinity. A pH of 7 is defined as neutral. Large variations above or below this value are considered harmful to most aquatic life.

pH monitoring period means the time period in which the pH of stormwater runoff from a site must be tested a minimum of once every seven days to determine if stormwater pH is between 6.5 and 8.5.

Point source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, and container from which pollutants are or may be discharged to surface waters of the State. This term does not include return flows from irrigated agriculture. (See Fact Sheet for further explanation.)

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, domestic sewage sludge (biosolids), munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste. This term does not include sewage from vessels within the meaning of section 312 of the CWA, nor does it include dredged or fill material discharged in accordance with a permit issued under section 404 of the CWA.

Pollution means contamination or other alteration of the physical, chemical, or biological properties of waters of the State; including change in temperature, taste, color, turbidity, or odor of the waters; or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the State as will or is likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety or welfare; or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or to livestock, wild animals, birds, fish or other aquatic life.

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product (40 CFR 122.1).

Receiving water means the water body at the point of discharge. If the discharge is to a storm sewer system, either surface or subsurface, the receiving water is the water body to which the storm system discharges. Systems designed primarily for other purposes such as for ground water drainage, redirecting stream natural flows, or for conveyance of irrigation water/return flows that coincidentally convey stormwater are considered the receiving water.

Representative means a stormwater or wastewater sample which represents the flow and characteristics of the discharge. Representative samples may be a grab sample, a time-proportionate composite sample, or a flow proportionate sample. Ecology's Construction Stormwater Monitoring Manual provides guidance on representative sampling.

Sanitary sewer means a sewer which is designed to convey domestic wastewater.

Sediment means the fragmented material that originates from the weathering and erosion of rocks or unconsolidated deposits, and is transported by, suspended in, or deposited by water.

Sedimentation means the depositing or formation of sediment.

Sensitive area means a water body, wetland, stream, aquifer recharge area, or channel migration zone.

SEPA (State Environmental Policy Act) means the Washington State Law, RCW 43.21C.020, intended to prevent or eliminate damage to the environment.

Significant Amount means an amount of a pollutant in a discharge that is amenable to available and reasonable methods of prevention or treatment; or an amount of a pollutant that has a

reasonable potential to cause a violation of surface or ground water quality or sediment management standards.

Significant concrete work means greater than 1000 cubic yards poured concrete or recycled concrete over the life of a project.

Significant Contributor of Pollutants means a facility determined by Ecology to be a contributor of a significant amount(s) of a pollutant(s) to waters of the State of Washington.

Site means the land or water area where any "facility or activity" is physically located or conducted.

Source control BMPs means physical, structural or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater. A few examples of source control BMPs are erosion control practices, maintenance of stormwater facilities, constructing roofs over storage and working areas, and directing wash water and similar discharges to the sanitary sewer or a dead end sump.

Stabilization means the application of appropriate BMPs to prevent the erosion of soils, such as, temporary and permanent seeding, vegetative covers, mulching and matting, plastic covering and sodding. See also the definition of Erosion and Sediment Control BMPs.

Storm drain means any drain which drains directly into a storm sewer system, usually found along roadways or in parking lots.

Storm sewer system means a means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains designed or used for collecting or conveying stormwater. This does not include systems which are part of a combined sewer or Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Stormwater means that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Stormwater Management Manual (SWMM) or Manual means the technical Manual published by Ecology for use by local governments that contain descriptions of and design criteria for BMPs to prevent, control, or treat pollutants in stormwater.

Stormwater Pollution Prevention Plan (SWPPP) means a documented plan to implement measures to identify, prevent, and control the contamination of point source discharges of stormwater.

Surface Waters of the State includes lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Temporary Stabilization means the exposed ground surface has been covered with appropriate materials to provide temporary stabilization of the surface from water or wind erosion. Materials include, but are not limited to, mulch, riprap, erosion control mats or blankets and temporary cover crops. Seeding alone is not considered stabilization. Temporary stabilization is not a substitute for the more permanent "final stabilization."

Total Maximum Daily Load (TMDL) means a calculation of the maximum amount of a pollutant that a water body can receive and still meet state water quality standards. Percentages of the total maximum daily load are allocated to the various pollutant sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The TMDL calculations must include a "margin of safety" to ensure that the water body can be protected in case there are unforeseen events or unknown sources of the pollutant. The calculation must also account for seasonable variation in water quality.

Treatment BMPs means BMPs that are intended to remove pollutants from stormwater. A few examples of treatment BMPs are detention ponds, oil/water separators, biofiltration, and constructed wetlands.

Transparency means a measurement of water clarity in centimeters (cm), using a 60 cm transparency tube. The transparency tube is used to estimate the relative clarity or transparency of water by noting the depth at which a black and white Secchi disc becomes visible when water is released from a value in the bottom of the tube. A transparency tube is sometimes referred to as a "turbidity tube."

Turbidity means the clarity of water expressed as nephelometric turbidity units (NTU) and measured with a calibrated turbidimeter.

Uncontaminated means free from any contaminant, as defined in MTCA cleanup regulations. See definition of "contaminant" and WAC 173-340-200.

Waste Load Allocation (WLA) means the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality based effluent limitation (40 CFR 130.2[h]).

Water quality means the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose.

Waters of the State includes those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the State" as defined in Chapter 90.48 RCW, which include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Well means a bored, drilled or driven shaft, or dug hole whose depth is greater than the largest surface dimension. (See Injection well.)

Wheel wash wastewater means any water used in, or resulting from the operation of, a tire bath or wheel wash (BMP C106: Wheel Wash), or other structure or practice that uses water to physically remove mud and debris from vehicles leaving a construction site and prevent track-out onto roads. When stormwater comingles with wheel wash wastewater, the resulting water is considered wheel wash wastewater and must be managed according to Special Condition S9.D.9.

APPENDIX B – ACRONYMS

AKART	All Known, Available, and Reasonable Methods of Prevention, Control, and Treatment
BMP	Best Management Practice
CESCL	Certified Erosion and Sediment Control Lead
CFR	Code of Federal Regulations
CKD	Cement Kiln Dust
cm	Centimeters
CTB	Cement-Treated Base
CWA	Clean Water Act
DMR	Discharge Monitoring Report
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
FR	Federal Register
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SWMM	Stormwater Management Manual
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control
USC	United States Code
USEPA	United States Environmental Protection Agency
WAC	Washington Administrative Code
WQ	Water Quality
WWHM	Western Washington Hydrology Model

What do I need to use the WAWebDMR system?

The WAWebDMR system requires a few common computer components:

- PC or Mac.
- DSL or Broadband Internet connection.
- Web browser (Internet Explorer 7.0 or higher, Chrome, FireFox, etc.).
- Personal e-mail account.
- Printer.

So how do I get started?

Step by step registration instructions, with screen shots, are provided at: www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html

Click on the "How to register for WAWebDMR" link to download the registration instructions.

The steps are summarized here:

1. Sign up for a Secure Access Washington (SAW) account or use an existing SAW account.
2. In SAW, register for a new service: Electronic Discharge Monitoring Reports (WAWebDMR).
3. Define a "role" under your permit.
4. Create an electronic signature account (if required).
5. Fill out the electronic signature agreement (ESA) form, print it, and mail to Ecology (if required).
6. Look for your approval e-mail and follow the instructions contained in it.

Need help?

Please feel free to contact Ecology if you have any questions about WAWebDMR.

For technical assistance and help getting registered, contact the WAWebDMR help staff at:

E-mail: WAWebDMR@ecy.wa.gov
Phone: 1-800-633-6193/Option 3
or 360-407-7097 (Local)

For permit-specific or urgent issues, please contact the one of the Ecology offices below:

Central Regional Office - Yakima
WAWebDMR-CRO@ecy.wa.gov

Eastern Regional Office - Spokane
WAWebDMR-ERO@ecy.wa.gov

Northwest Regional Office - Bellevue
WAWebDMR-NWRO@ecy.wa.gov

Southwest Regional Office - Lacey
WAWebDMR-SWRO@ecy.wa.gov

Major Industrial Unit (Ecology HQ)
WAWebDMR-Industrial@ecy.wa.gov

Stormwater Unit (Ecology HQ)
WAWebDMR-Stormwater@ecy.wa.gov

If you need this document in a version for the visually impaired, call the Water Quality Program at 360-407-6401. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

Electronic Discharge Monitoring Reports (WAWebDMR)



Washington State Department of Ecology

DEPARTMENT OF
ECOLOGY
State of Washington

Publication No. 11-10-013
Rev. 03/2011

What is WAWebDMR?

WAWebDMR is a new approach to submitting your Discharge Monitoring Reports (DMRs) to the Department of Ecology. Unlike the current paper method, this new system is fast, available 24/7 over the Internet, and customized for your facility and permit(s). There is no longer a need to calculate the delay for mailing your paper DMRs. Instead, log onto the Internet, select your permit information, select the begin date, enter your values, and then submit the data. We'll even store your data for you after you submit the DMR, just in case you need to redo or reprint it.

How much does it cost?

There are no fees for registering for and using the WAWebDMR system.

Must all DMR submittals be by WAWebDMR?

The WAWebDMR is voluntary at this time (except for sites covered by the construction stormwater general permit). However, we encourage all facilities to give WAWebDMR a try and find out how easy submitting a DMR can be.

Who can have access & what does that access allow?

There are three different roles to choose from when you sign up for WAWebDMR. They are:

Facility Coordinator – Can assign staff to the signer and preparer roles to work on DMRs, and can sign and prepare DMRs themselves.

Examples: permittee, responsible official, delegated authority (environmental manager).

Facility Signer – Can sign and prepare DMRs, and is usually granted access to WAWebDMR by a Facility Coordinator.

Example: delegated authority (plant supervisor, CESCL).

Facility Preparer – Can prepare DMRs and is granted access to WAWebDMR only by a Facility Coordinator.

Examples: contractors, secretaries, data entry staff.

If I sign DMRs for more than one facility/permit do I need a WAWebDMR account for each?

You can register more than one facility/permit under one account. All we ask is that when you register (as a coordinator or signer), you provide proof that you are responsible for each of your listed facilities/permits.

What sort of proof?

Proof comes in the form of a copy of one of the following:

- A previously submitted DMR.
- A permit's cover sheet.
- A permit's letter of coverage.
- Mail from Ecology that includes both the facility's name and the permit number.
- Signature authority delegation letter signed by the permittee (responsible official).

What do I get out of this?

With this system you will have the following benefits:

- Available 24/7.
- Enter both daily and summarized data together.
- Enter your data over time or all at once.
- No delay between mailing the DMR and Ecology receiving it.
- Fill in the data at one location then inform your supervisor in another location to view and submit the DMR.
- Electronic DMRs are customized for both the facility and the permit, including specific reporting requirements for your permit.
- Person signing DMR gets immediate e-mail confirmation.
- Submitted DMRs can be accessed online for re-printing or re-submitting.
- You can add attachments (lab sheets, etc.) to your DMR submission.
- System tracks by whom and when a DMR was submitted.
- Notifies third party people when you sign your DMR.
- Add monitoring points when you need them (construction stormwater and sand & gravel general permits only).

NOTE: The WebDMR name changed to WAWebDMR on March 30,

- The banner on the main WAWebDMR page has changed
- The web address remains the same

CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

For
Foss Waterway Development Authority

Prepared For
Washington State Department of Ecology Southwest Regional Office PO Box 47775 Olympia, Washington 98504-7775 360.407.6300

Owner	**Developer**	**Operator/Contractor**
535 East Dock Street Suite #204	535 East Dock Street Suite #204	*To Be Selected by Owner*
Tacoma, Washington 98402	Tacoma, Washington 98402	
Su Dowie	Su Dowie	

Project Site Location
2110 East D Street, Tacoma, Washington

Certified Erosion and Sediment Control Lead
GeoEngineers, Inc. Nick Rohrbach CESCL # ECO-3-4290928

SWPPP Prepared By
GeoEngineers, Inc. 1101 South Fawcett Avenue, Suite 200, Tacoma, Washington 98402 253.383.4940

SWPPP Preparation Date
December 22, 2011

Approximate Project Construction Dates
March-May 2012

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Appendix G. Construction Stormwater Site Inspection Checklist
Appendix H. Discharge Monitoring Report Form (to be added if permit holder requests paper submittal)
Appendix I. Ecology Correspondence (to be added as project proceeds)
Appendix J. Completed DMRs and Construction Stormwater Site Inspection Checklists (to be added as project proceeds)

1.0 INTRODUCTION

This Construction Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the Foss Waterway Development Authority (FWDA) for construction activities associated with the American Plating Site (Site) Remediation project. Remediation at the Site is being completed by the FWDA under a Prospective Purchaser Consent Decree (CD) (No. 03 2 14513 6) issued by the Washington Department of Ecology (Ecology). The Site is located at 2110 East D Street in Tacoma, Washington (Figure 1). The purpose of this SWPPP is to describe the Temporary Erosion Sediment Control (TESC) measures, pollution prevention measures, inspections/monitoring activities, and recordkeeping that will be implemented during the project. This SWPPP was prepared based on the general requirements set forth in the Ecology *Construction Stormwater General Permit* (CSWGP) (Appendix E) and the *Stormwater Management Manual for Western Washington* (SWMMWW) (Ecology, 2005a). This SWPPP satisfies minimum requirements #1 through #5 of the SWMMWW (Ecology, 2005a) as applicable to the planned project.

All project water, including stormwater and pumped groundwater (if necessary), will be contained and controlled on Site. No discharges of any project water will be allowed outside the Site boundaries. The contractor will create a water management plan and will provide a temporary water management system. All project water will be routed to the contractor-provided temporary water management system, which will store and/or treat all project water as necessary and ultimately discharge the water to the City of Tacoma (City) sanitary sewer system after compliance with the City special authorization discharge (SAD) permit criteria has been achieved. Once the Site has been fully restored and stabilized, stormwater will be allowed to leave the Site as long as turbid waters do not enter "Waters of the State" (as defined in Revised Code of Washington (RCW) 90.48.020).

The objectives of the SWPPP are to:

1. Describe Best Management Practices (BMPs) intended to prevent erosion and sedimentation, and to identify, contain and control all project water and project water pollution resulting from construction activity.
2. Reduce the likelihood of causing violations of surface water quality, groundwater quality, or sediment management standards.
3. During the construction phase, reduce the likelihood of causing adverse water quality impacts including any impacts on beneficial uses of the receiving water by containing and controlling all project water on Site.

The SWPPP is divided into six main sections with several appendices that include stormwater related reference materials. The topics presented in each of the main sections are:

- Section 1 – INTRODUCTION AND SITE PROJECT DESCRIPTION. This section provides a summary of the project, and describes the organization of the SWPPP document. This section provides a detailed description of the existing Site conditions, and proposed construction activities, for existing conditions and post–construction conditions.

- Section 2–CONSTRUCTION STORMWATER BMPs. This section provides a detailed description of the BMPs to be implemented based on the 12 required elements of the SWPPP (Ecology, 2005a). For each element of stormwater pollution prevention there are required approved construction management approaches, techniques, materials and installations details. Recommended additional alternative BMPs are presented in Appendix C.
- Section 3 – CONSTRUCTION SCHEDULE AND BMP IMPLEMENTATION. This section provides a description of the timing of the BMP implementation in relation to the project schedule.
- Section 4 – POLLUTION PREVENTION TEAM. This section identifies the appropriate contact names (emergency and non-emergency), monitoring personnel, and the on-site Certified Erosion and Sediment Control Lead (CESCL) inspector.
- Section 5 – SITE INSPECTION AND MONITORING. This section provides a description of the inspection and monitoring requirements such as the constituents of concern (COCs) to be monitored, sample locations, sample frequencies, and sampling methods for stormwater discharge locations from the Site.
- Section 6 – REPORTING AND RECORDKEEPING. This section describes the requirements for documentation of the BMP implementation, Site inspections, monitoring results, and changes to the implementation of certain BMPs due to Site factors experienced during construction. The Site Inspection Checklist and Discharge Monitoring Report (DMR) forms, which are to be completed during Site inspections, can be found in Appendices G and H.

Supporting documentation and standard forms are provided in the following Appendices:

- Appendix A – Project Design Plans
- Appendix B – Required BMPs
- Appendix C – Additional Alternative BMPs
- Appendix D – Notice of Intent to Ecology for Coverage under the NPDES Construction Construction Stormwater General Permit
- Appendix E – Construction Stormwater General Permit
- Appendix F – Draft Special Authorization Discharge (SAD) Permit – City of Tacoma
- Appendix G – Construction Stormwater Site Inspection Checklist
- Appendix H – Discharge Monitoring Report Form
- Appendix I – Ecology Correspondence
- Appendix J – Completed DMRs and Construction Stormwater Site Inspection Checklists

2.0 SITE PROJECT DESCRIPTION

2.1. Existing Conditions

The Site is located at 2110 East D Street, which is along the eastern edge of the Thea Foss Waterway (Foss) (Figure 1 – Vicinity Map). This Site is located on Pierce County parcel number 8950001761. Portions of the Site are located within the Foss Habitat Mitigation Area and the S-8 Shoreline District based on City designations. The Site has primarily been historically used for light

industrial activities. Puget Sound Plating and Seymour Electroplating occupied the Site between 1955 and 1976. Lewis R. Jones owned the property from 1962 to 2003. American Plating occupied the Site from 1976 to 1986. All three firms performed metal plating operations. Former structures at the Site included several buildings that housed metal plating operations as well as concrete sumps, drainage features, piping and an aboveground storage tank (AST) that supported operations in the buildings. Ecology performed an interim action in 2003 to demolish and remove the majority of buildings and related structures on the Site. A temporary asphalt access road and several concrete features (foundations/structures/slabs) remain at the Site.

The FWDA currently leases portions of the Site for Berg Scaffolding (Berg) business operations, who uses the Site for storage of scaffolding materials, equipment and vehicle parking. All Berg-related materials, equipment and vehicles will be removed from the Site prior to initiating project activities. The FWDA has plans to develop the Site into a City park during a future construction phase.

The Site currently slopes gently to the south and west at slopes of 0-5 percent towards Berg and the Foss. In general, stormwater does not flow on Site from adjacent off Site areas. Vegetation includes invasive shrub vegetation, grass, and cottonwood trees.

Throughout this document, the term "Site" refers to the area within the limits of the parcel boundary within which all remedial activities are to be performed.

2.1.1. Soils and Erosion Potential

Various investigations have been performed at and around the Site. The following soils description is based on the Draft Final Cleanup Action Plan (CAP) (GeoEngineers, 2003). The Site is built on fill material of variable thickness placed in the early 1900s, coincident with the development of the Foss. The fill material overlies unconsolidated silt, which ranges in thickness from 0 to greater than 15 feet. Beneath the silt is a deposit of sand, gravel and silt that ranges in thickness from 5 to over 10 feet. Beneath the sand gravel and silt is a deposit of dense to very dense silty sand to silty gravel that extends to at least 25 to 30 feet below ground surface (bgs). This unit has been interpreted as glacial till.

As part of restoring the Site, soil capping activities will create new topography that may increase erosion potential if left bare. Site restoration plans include stabilizing these new topographic features with hydroseed and native vegetation plantings to mitigate the potential for erosion potential post-construction.

2.2. General Construction Activities

Proposed activities generally include shallow excavation of near-surface (3 to 5 feet bgs) soils from specific areas containing COCs at concentrations exceeding Site specific cleanup levels. The specific components of the Cleanup Action are outlined in the Draft Engineering Design Report (Draft EDR; GeoEngineers, 2011). The proposed excavation includes removal of soil from two remedial action excavation areas and two trench corridors proposed for new stormwater utilities. The total estimated tonnage of contaminated soil to be removed from the Site is approximately 422 tons.

All vegetation, debris, trash, existing concrete structures and existing asphalt pavement will be cleared and grubbed to facilitate access and construction activities. Prior to excavation, utilities will be located and removed or protected in place. Excavated soil will be temporarily stockpiled on Site and staged for off-site disposal. All of the contaminated soil excavated will be transported off-site for permitted disposal. The excavated areas will be backfilled with either existing base course gravel removed from beneath the existing asphalt access road or clean, imported structural fill as required by the restoration plans for the Site. Temporary asphalt surfaces removed to access contaminated soil will be restored following the completion of excavation and backfill activities. Near shore areas of the Site will be restored with native plantings and hydroseed in accordance with the Final EDR.

There are plans as part of this project for replacing temporary impervious surfaces with new temporary asphalt pavement surfaces. The temporary asphalt surfaces will not be a part of the final permanent park design and construction for the Site. Two new stormwater filtration systems and associated drainage piping will be installed at appropriate locations to capture all temporary asphalt pavement surface water flows in accordance with City of Tacoma stormwater requirements.

Project work is scheduled to begin in late winter or early spring, from approximately March through May 2012. The project duration is anticipated to be five to six weeks, although the schedule may be extended as required to complete the work in a single effort. BMPs will be implemented to prevent all project water from leaving the Site. Project timing and construction sequencing are two significant parameters that can reduce the potential for contaminated project water leaving the Site. Project water containment will be achieved through BMP containment measures, the collection of all surface water in sediment traps that will be created during excavation of soils and through collection of groundwater (as needed) to complete remedial action excavations. Project water that collects in the BMPs and poses a threat to leaving the Site will be pumped into the temporary water management system.

2.2.1. Site Dewatering

The proposed timing for this project is March through May of 2012. Rainfall is typically less during these months compared to the winter months of the year, however heavy rains may occur. In the event that heavy rains occur during project activities, relevant and if necessary, BMPs will be implemented to collect accumulated surface water within the Site. Water will be directed to shallow sediment traps or the remedial action excavation areas within the Site and pumped to the temporary water management system. Collected project water will be characterized in accordance with SAD permit issued and approved by the City for discharge to the City sanitary sewer system.

2.3. BMP Elements

This SWPPP has been prepared in general accordance with the 2011 CSWGP and the 2005 SWMMWW. Based on the area of land disturbance (approximately 1.4 acres), minimum requirements #1 through #5 specified in the SWMMWW are applicable to this project. Note that the proposed impervious surface is temporary (not a part of final permanent park design and construction) and the proposed new temporary impervious surfaces do not add 50 percent or more to the existing temporary impervious surface.

A permanent Stormwater Quality Control Plan will not be prepared because this phase of work is temporary and is being completed to satisfy the Prospective Purchaser CD requirements. The permanent Stormwater Quality Control Plan for the Site will be prepared during final design of the proposed permanent park. A TESC Plan (Appendix A: Figures A-1, A-2 and A-3) is included in this SWPPP to satisfy minimum requirement #1 outlined in the SWMMWW. The project will comply with the 12 elements of a SWPPP (discussed below), outlined in Special Condition S9.D.1-12 of the CSWGP, including BMPs used to address each element to satisfy minimum requirement #2 outlined in SWMMWW.

Additional alternate BMPs for each BMP element are included in Appendix C as a quick reference tool for the on-site CESCL inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the CSWGP (Appendix E). To avoid potential erosion and sediment control issues that may cause a violation(s) of the CSWGP, the CESCL will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after inspection indicates the first indication of existing BMPs failure of ineffectiveness.

2.3.1. Element #1: Mark Construction Limits

To protect adjacent private properties and City rights-of-way (ROW), the limits of Site boundaries will be clearly marked before land-disturbing activities begin. All sensitive areas, including the boundary of the existing Habitat Enhancement Area located along the western Site boundary, will be clearly marked in the field using wood stakes and flagging. In general, outside of the project boundaries, natural vegetation, City ROWs, buildings and landscaping will be retained in an undisturbed state.

REQUIRED BMPS RELEVANT TO MARKING CLEARING LIMITS FOR THIS PROJECT INCLUDE:

- BMP C103: High Visibility Plastic Fence
- BMP C233: Silt Fence

2.3.2. Element #2: Establish Construction Access

Project access will be from East D Street. There is an existing concrete driveway that will serve as the preferred construction access (entry and exit). Other access to the Site on unpaved areas will be minimized, yet where necessary, access points will be stabilized (using quarry spalls or other relevant material) to minimize the tracking of sediment onto East D Street. Street sweeping and street cleaning will be employed to prevent sediment from being tracked onto East D Street and and/or from entering Waters of the State.

2.3.2.1. REQUIRED BMPS AND OTHER ACTIVITIES THAT ARE RELEVANT FOR THIS PROJECT TO ESTABLISH CONSTRUCTION ACCESS INCLUDE:

- BMP C105: Stabilized Construction Entrance
- BMP C107: Construction Road/Parking Area Stabilization
- Street Sweeping

2.3.2.2. ALTERNATIVE BMPS THAT MAY ADDITIONALLY BE USED FOR THIS PROJECT TO ESTABLISH CONSTRUCTION ACCESS INCLUDE:

- BMP C106: Wheel Wash

2.3.3. Element #3: Control Flow Rates

The Site currently slopes gently to the south and west at slopes of 0-5 percent, and there are generally no existing or proposed channels in which water can collect. Due to the gentle slopes and lack of channelization, concentrated flows are generally not expected to form on Site during construction activities. Sheet flow at the Site will be directed towards and collected within temporary interceptor swales that will be created during excavation activities. Precipitation falling on the Site that does not infiltrate into the ground will be collected and stored in the temporary water management system. The stored water will be analyzed. Based on the results of the analyses, stored project water will either be directly discharged to the City sanitary sewer system (when conditions allow) or treated and discharged to the City sanitary sewer system (i.e., if testing indicates unacceptable levels of contaminants are present).

After contaminated soils have been removed from the Site and the Site is fully stabilized and restored, stormwater runoff from the Site will be allowed to discharge to adjacent private property, City ROW and the Foss.

2.3.3.1. REQUIRED BMPS THAT ARE RELEVANT FOR CONTROLLING FLOW RATES ON THIS PROJECT INCLUDE:

- BMP C200: Interceptor Swale
- BMP C207: Sand Bag Check Dams
- BMP C240: Sediment Trap

2.3.3.2. ALTERNATIVE BMPS THAT MAY ADDITIONALLY BE USED TO CONTROL FLOW RATES FOR THIS PROJECT INCLUDE:

- BMP C208: Triangle Silt Dikes

2.3.4. Element #4: Install Sediment Controls

Sediment controls within the Site are necessary to prevent contamination of adjacent areas. Performing grading, excavation and backfilling activities during dry weather, project scheduling, construction phasing and emergency preparedness are important factors to consider in pollution prevention and sediment control. Efforts will be made to ensure that all project water does not leave the Site boundaries. Necessary materials that are readily accessible to address potential stormwater runoff are essential in preventing contamination of adjacent areas in the case of a potential storm event exceeding the 2-year storm. These materials will be made readily available for the duration of the project. Potential supplies to be kept on Site include pumps and pipe for removing surface waters from the area, tanks for storage of stormwater and ground cover including mulch or straw to protect soils from erosion. The contractor and CESCL inspector may exercise discretion in identifying the materials that may be appropriate depending on Site conditions and needs.

Temporary segregated stockpiles located within the materials management area will be handled with care and protected from weather impacts during all project activities. Materials stockpiled will include excavated materials, materials removed during Site preparation and imported materials for backfilling or capping activities. Plastic sheeting shall be used to temporarily cover each stockpile at the end of each work day and secured with wood staking or roped sandbags until each stockpile has been characterized for transport to a permitted off-site disposal facility. The stockpiled

material management areas will be constructed of Ecology blocks and lined with an impermeable barrier as detailed on Sheet A-2. All temporary stockpiles will be managed separately in order to prevent cross contamination or co-mingling of materials from different excavations or work areas. Any water that accumulates within the materials management area shall be contained and routed to the temporary water management system for storage or treatment, characterized in accordance with the City SAD permit and discharged to the City sanitary sewer once compliance with City standards has been achieved.

2.3.4.1. REQUIRED BMPS AND OTHER MATERIALS THAT ARE RELEVANT FOR SEDIMENT CONTROL ON THIS PROJECT INCLUDE:

- BMP C121: Mulching
- BMP C123: Plastic Covering
- BMP 150: Materials On Hand
- BMP C162: Scheduling
- BMP C240: Sediment Trap
- Sandbags

2.3.4.2. ALTERNATIVE BMPS THAT MAY ADDITIONALLY BE USED FOR SEDIMENT CONTROL ON THIS PROJECT INCLUDE:

- BMP C235: Straw Wattles (Gator Guards, compost filter socks)

2.3.5. Element #5: Stabilize Soils

In the event of precipitation, temporary segregated stockpiles will be managed as described in Section 2.3.4. Dust control measures will be implemented if conditions are dry and there is risk of wind transporting dust from disturbed surfaces off Site. Site surface areas will either be restored with hydroseed, re-vegetated with native plants or stabilized with a gravel or asphalt surface to serve as temporary erosion control tools until the City park is constructed during a future phase of work.

The remediation and utility corridor areas will be backfilled with either clean, imported structural fill or with existing base course gravel removed from beneath the existing temporary asphalt access road. Temporary asphalt surfaces removed during excavation activities will also be restored following the completion of excavation and backfilling activities. Sufficient quantities of erosion prevention and sediment control materials will be kept on the Site at all times to be used for emergency situations (e.g., heavy rains) until permanent Site stabilization.

2.3.5.1. REQUIRED BMPS THAT ARE RELEVANT FOR STABILIZING SOILS ON THIS PROJECT INCLUDE:

- BMP C120: Temporary and Permanent Seeding
- BMP C121: Mulching
- BMP C123: Plastic Covering
- BMP C140: Dust Control
- BMP C150: Materials on Hand

2.3.5.2. ALTERNATIVE BMPS THAT MAY ADDITIONALLY BE USED FOR THIS PROJECT TO STABILIZE SOILS INCLUDE:

- BMP C122: Nets and Blankets

2.3.6. Element #6: Protect Slopes

The topography of the Site includes generally flat areas or slopes up to approximately 5 percent grade. Erosional processes related to increased water velocity and decreased infiltration along slopes is not anticipated for this project because of the soil types and gentle slopes.

2.3.7. Element #7: Protect Drain Inlets

Drain inlets are located outside of the Site project area. One drain inlet is located just to the north of the Site ingress and egress driveway on East D Street. Two other drain inlets are located just south of the southern project boundary, next to the Berg Scaffolding office and storage building. No project water from the Site shall be allowed to discharge into adjacent drain inlets. However, as an added precaution, these drain inlets will be temporarily protected with catch basin filter socks, as shown on Sheets A-1 and A-2.

2.3.8. Element #8: Stabilize Channels and Outlets

There are no channels or outlets on or adjacent to the Site. Therefore, no measures are considered necessary to satisfy minimum requirement #4 outlined in the SWMMWW for preservation of natural drainage systems and outfalls.

2.3.9. Element #9: Control Pollutants

Petroleum products contained in tanks, generators, pumps, etc., will be double-contained to prevent any spills. Construction equipment and vehicles will be properly maintained to prevent fluid leaks. If a spill is detected, it will be cleaned up immediately. Vehicle maintenance or fueling will be performed off-site at an appropriate facility or on Site at a designated equipment staging area that is secured and maintained. Vehicles, equipment, and petroleum product storage/dispensing areas will be inspected daily to detect any spills and to prevent leaks. The fueling of construction vehicles and equipment will be conducted by a fueling service and/or from a fuel tank located on a contractor vehicle. Personnel performing fuel transfers will be present at all times to observe fuel transfers. In the event emergency repairs are necessary on Site, the contractor will use drip containers, plastic sheeting, or other equivalent measures to prevent stormwater contamination or other contamination on Site.

Chemicals will be stored in a designated storage area which will conform to the appropriate source control BMPs listed in Volume IV of the SWMMWW (Ecology, 2005b). Chemicals will have cover, containment, and protection provided on Site per BMP C153 for Material Delivery, Storage and Containment (Ecology, 2005b).

A minimum of two spill response kits will be located on Site for rapid and easy access. Any equipment leaks (including but not limited to fuel tanks, equipment seals, or hydraulic hoses) will be contained within a spill pad placed beneath potential leak sources. The spill response kit will include the minimum materials identified in BMP C153 for Material Delivery, Storage and Containment (Ecology, 2005b). The contractor will be prepared to excavate and remove impacted soil if a spill occurs. The doors to the cabs of heavy equipment will be locked at the end of each

work day. Spilled material tracked onto East D Street will be cleaned up immediately.

The contractor will provide and maintain temporary toilet facilities during construction to accommodate workers. These facilities will be self-contained with no discharge. Waste removed from these facilities will be disposed at a permitted off-site facility. Portable sanitation facilities will be locked at the end of each work day, regularly maintained, and emptied when necessary.

Materials generated through Site preparation and excavation will be temporarily stockpiled within the materials management area, which will later be removed from the Site for permitted off-site disposal. All project water will be contained and treated within the Site boundaries to prevent COCs from spreading to areas adjacent to the Site or discharging from the Site. These measures will satisfy minimum requirement #3 outlined in SWMMWW for source control of pollution at the Site.

2.3.9.1. REQUIRED BMPS THAT ARE RELEVANT FOR THE CONTROL OF POLLUTANTS AT THE PROJECT SITE INCLUDE:

- BMP C153: Material Delivery, Storage and Containment

2.3.10. Element #10: Control Dewatering

Dewatering activities within the Site include removal of ponded surface waters from temporary interceptor swales, temporary sediment traps and excavation areas. All project water will be pumped into the temporary water management system. The stored water will be tested for release in accordance with City SAD permit and treatment will be performed, if necessary, before being disposed to the City sanitary sewer system. Groundwater levels at the Site are expected to be below excavation elevations and are not anticipated to contribute to dewatering efforts. Appropriate pumping methods are to be determined by the contractor depending on Site conditions and needs.

2.3.10.1. REQUIRED BMPS AND OTHER EQUIPMENT THAT ARE RELEVANT FOR CONTROL DEWATERING ON THIS PROJECT INCLUDE:

- BMP C200: Interceptor Swale
- BMP C240: Sediment Trap
- BMP C250: Construction Stormwater Chemical Treatment
- BMP C251: Construction Stormwater Filtration
- Temporary water storage tanks

2.3.10.2. ALTERNATIVE ACTIVITIES THAT MAY ADDITIONALLY BE APPLIED FOR THIS PROJECT FOR CONTROL DEWATERING INCLUDE:

- Providing additional temporary on Site water storage tanks
- Trucking project water to a permitted off-site disposal facility approved by the Engineer (listed in Table 4-1 below)

2.3.11. Element #11: Maintain BMPs

Temporary and permanent erosion and sediment control BMPs will be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair will be conducted in accordance with each particular BMP's specifications. Visual monitoring of the

BMPs will be conducted at least once every calendar week and within 24 hours after any rainfall event. If the Site becomes inactive, and is temporarily stabilized, the inspection frequency will be reduced to once every month.

Temporary erosion and sediment control BMPs will be removed within 30 days after the final Site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment resulting from remediation activities will be handled in a manner consistent with other remediated soils from the Site. Disturbed soil resulting from removal of BMPs or vegetation will be permanently stabilized.

2.3.11.1. REQUIRED BMPS THAT ARE RELEVANT FOR MAINTAINING BMPS ON THIS PROJECT INCLUDE:

- BMP C150: Materials on Hand
- BMP C160: Certified Erosion and Sediment Control Lead

2.3.12. Element #12: Project Management

Engaged project management of TESC BMPs and clear, effective communication with the construction project manager by the CESCL is imperative to successful implementation of this SWPPP. The CESCL will be on Site weekly or more often, as required, to ensure proper implementation of BMPs and handling of all project water.

A preconstruction meeting to review the SWPPP and TESC Plan will be scheduled prior to beginning remediation activities. A preconstruction Site visit will also be scheduled prior to beginning of the project. During the Site visit the Contractor, the CESCL and a representative from the project design team will walk the Site and delineate the Site boundary.

Temporary erosion and sediment control BMPs for this construction project have been designed based on the following principles:

- Design the project to fit the existing topography, soils and drainage patterns.
- Minimize the extent and duration of the area exposed.
- Divert flows from entering the project area.
- Contain runoff.
- Retain sediment on Site within the project boundary.
- Thoroughly monitor the Site and maintain erosion and sediment control measures.
- Schedule major earthwork during dry weather.

Because the project Site is located west of the Cascade Mountain Crest, the project will be managed according to the key project components discussed below in Sections 2.3.13 to 2.3.15.

2.3.13. Phasing of Construction: Seasonal Work Limitations

The project will need to be phased by the contractor to minimize the potential for soil erosion and the transport of sediment from the Site during construction. To that end, the project will be scheduled to minimize excavation and contaminated soil handling within dry weather periods. It is impracticable to stop work due to a change in season and still maintain FWDA's schedule for

completion of the cleanup activities at the Site. Schedule delays or other unforeseen factors may require that the excavation and handling of contaminated soil occur during wet weather. In this case, the work will be conducted to maintain the intent of the BMPs outlined in this SWPPP and conditions of the CSWGP. The remaining Site activities, those that are not associated with excavation and handling of contaminated soil, such as grading, planting, and other soil disturbing activities are also likely to occur within the wet season (October 1 through April 30), and will be completed in a manner that maintains the conditions of the CSWGP.

The following activities are exempt from the seasonal limitations:

- Routine maintenance and necessary repair of erosion and sediment control BMPs;
- Routine maintenance of public facilities or existing utility structures that do not expose the soil or result in the removal of the vegetative cover to soil.

2.3.14. BMPs Inspection and Monitoring

BMPs will be inspected, maintained, and repaired, as needed, to ensure continued performance of their intended functions as described in Section 5.1. Site inspections will be conducted by the CESCL who will be available either during hours of operation and/or on an on-call basis. The name and contact information for the CESCL is provided in Section 4.2 of this SWPPP.

The CESCL has the necessary skills to:

- Assess the Site conditions and construction activities that could impact the quality of stormwater, and
- Assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

Additional alternative BMPs or design changes will be implemented as soon as possible whenever inspection and/or monitoring reveals that the BMPs identified in this SWPPP are inadequate because of an actual discharge event or potential for a discharge event of environmental pollutants.

2.3.14.1. BMPS THAT ARE RELEVANT FOR MANAGING THE PROJECT INCLUDE:

- BMP C160: Certified Erosion and Sediment Control Lead

2.3.15. Maintaining this SWPPP

Minor changes in the field during construction will be reflected in revisions to the project SWPPP. Site maps (sheet size: 11" x 17") will be provided to the Contractor and CESCL for mark up of changes to the TESC Plan as they are made in the field.

- This SWPPP will be retained on-site and used as the Site Log Book.
- The SWPPP will be modified whenever:
    - There is a change in the design, construction, operation, or maintenance at the Site that has, or could have, a significant effect on the discharge of pollutants to Waters of the State.

- During inspections or investigations conducted by the owner/ operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the Site. The SWPPP will be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP will be completed within seven (7) days following the inspection.

2.4. Additional BMPs

BMPs outlined in the 12 elements of this SWPPP (Section 2.3) will be implemented by the contractor. The TESC Plan (Appendix A: Figures A-2 and A-3) shows some of the required BMPs to be implemented. Additional alternative BMPs that may be implemented are contained in Appendix C.

- A Certified Erosion and Sediment Control Lead will be on Site or on call at all times during active construction hours.
- Whenever inspection and/or monitoring reveals that the BMPs identified in this SWPPP are inadequate, due to potential to discharge a significant amount of pollutants, appropriate BMPs or design changes will be implemented as soon as possible.

3.0 CONSTRUCTION SCHEDULE AND BMP IMPLEMENTATION

The BMP implementation schedule is driven by the construction schedule. The project is currently preliminarily scheduled to be constructed in late winter/early spring of 2012 (March through May). A final construction schedule will be provided by the contractor after the preconstruction meeting. The following provides a sequential list of the preliminary proposed construction schedule milestones and the corresponding BMP implementation schedule. .

The Site is located west of the Cascade Mountain Crest. As such, the dry season is considered to be from May 1 to September 30 and the wet season is considered to be from October 1 to April 30.

Estimated start date of Construction: Approximately March 2012

Estimated finish date of Construction: Approximately May 2012

It is impracticable to stop work due to a change in season and still maintain FWDA's schedule for completion of the cleanup activities at the Site. Schedule delays or other unforeseen factors may require that the excavation and handling of contaminated soil occur within the wet season. In this case, the work will be conducted to maintain the intent of the BMPs outlined in this SWPPP and conditions of the CSWGP.

An estimated construction sequence is provided below:

- Mobilize equipment and materials to the Site
  - Mobilize and store TESC and soil stabilization products (Appendix B - BMP C150: Materials on Hand).
- Install TESC measures
  - Mark construction limits.

  - Install silt fence as applicable for sediment control.
  - Install stabilized construction entrance and access routes. There is an existing asphalt access road that shall be the preferred construction access; any additional access will need to be stabilized.
- Block drainages from flowing onto the Site and divert flows to adjacent City or private property areas. (Note that in general, stormwater does not flow on Site from adjacent off-Site areas; however, this will be re-checked by the contractor during site preparation and BMP installation).
- Have materials readily available including pumps, storage tanks and erosion control ground cover.
- Complete remedial and utility corridor excavations in designated locations to the extent allowable by the Site access and work flow conditions.
- Implement chemical analytical testing as outlined in the Ecology-approved Engineering Design Report.
- Project water will be collected into the temporary water management system, stored or treated to meet the effluent requirements identified within the City SAD permit. Water samples will be collected for chemical analysis by the Engineer to verify compliance with the City SAD permit effluent requirements and water sample results will be forwarded to the City for review and final acceptance for discharge to sanitary sewer system:
  - If contaminants are either not detected or detected at concentrations equal to or less than City sanitary sewer discharge criteria identified in the SAD permit, the water will be transferred into a water truck and discharged to the City designated sanitary sewer manhole identified in the City SAD permit.
  - If contaminants are detected at concentrations exceeding City sanitary sewer discharge criteria identified in the SAD permit, the water will be treated in the temporary water management system and re-tested. This will be repeated until analytical results indicate the water can be disposed of to the City designated sanitary sewer manhole identified in the City SAD permit.
- Excavation of soils within the Site will be conducted to meet the cleanup criteria outlined in the Ecology-approved Final EDR. If needed, remove water that has collected in the excavation areas and direct it to the temporary water management system.
- Once contaminated soil removal has been verified as completed based on chemical analytical testing results of materials, continue to contain and collect all project water and route it to the temporary water management system until the Site has been fully restored and stabilized.
- Stabilize and restore the Site
  - Implement soil stabilization, sediment control BMPs and restoration activities throughout the Site.
  - Monitor and remove erosion control BMPs once the Site has been fully restored/stabilized and the contractor has received final approval from the Engineer and FWDA.
- Complete restoration plan – including the habitat restoration area.

Implementation of the construction SWPPP elements #1 through #12, coupled with efficient construction scheduling and phasing and implementation of additional BMPs on as-needed basis, will work together to satisfy the minimum requirement #5 outlined in SWMMWW for managing stormwater on Site.

4.0 POLLUTION PREVENTION TEAM

4.1. Roles and Responsibilities

The pollution prevention team consists of personnel responsible for implementation of the SWPPP, including the following:

- CESCL – primary contractor contact, responsible for Site inspections (BMPs, visual monitoring, sampling, recording, etc.); to be called upon in case of failure of any erosion and sediment control (ESC) measures.
- Resident Engineer –Site representative for the FWDA that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's Site supervisor or representative.
- Emergency Ecology Contact – individual to be contacted at Ecology in case of an emergency.
- Emergency Owner Contact – individual responsible at the FWDA or representative of the FWDA to be contacted in case of an emergency.
- Non-Emergency Ecology Contact – individual to be contacted at Ecology in non-emergency situations.
- Monitoring Personnel – personnel responsible for conducting water quality monitoring. For this Site, the monitoring personnel is also the CESCL.

4.2. Team Members

Names and contact information for those identified as members of the pollution prevention team are provided in the following table.

TABLE 4-1. POLLUTION PREVENTION TEAM MEMBERS

Title	Name	Agency/Company	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	Nick Rohrbach	GeoEngineers, Inc.	253.732.2138
Engineer	Iain Wingard	GeoEngineers, Inc.	206.595.7402
Emergency Ecology Contact	NA	Washington State Department of Ecology	360.407.6300
Non-Emergency Ecology Contact	Marv Coleman	Washington State Department of Ecology	253.227.7780
Emergency Owner Contact	Su Dowie	Foss Waterway Development Authority	253.597-8122
Monitoring Personnel	Nick Rohrbach	GeoEngineers, Inc.	253.732.2138

Note:

All spills of hazardous materials and/or oil must be reported immediately by the spiller. Call these two numbers: Washington Emergency Management Division: 1-800-OILS-911 National Response Center: 1-800-424-8802

5.0 SITE INSPECTION AND MONITORING

Site inspections and project water monitoring will comply with Section S3.A of the CSWGP (Appendix E). Discharges of any project water are not authorized outside the Site boundaries.

Ecology presumes that a Permittee complies with water quality standards unless discharge monitoring data or other Site-specific information demonstrates that a discharge causes or contributes to a violation of water quality standards, when the Permittee complies with the following conditions. The permittee must fully:

1. Comply with the permit conditions, including planning, sampling, monitoring, reporting, and recordkeeping conditions.
2. Implement stormwater BMPs contained in stormwater management manuals published or approved by Ecology, or BMPs that are demonstrably equivalent to BMPs contained in stormwater technical manuals published or approved by Ecology. Note that for this project the SWMMWW is the referenced manual.

Project water monitoring includes visual inspections of construction activities and BMPs, monitoring of water COCs and documentation of the inspection and monitoring findings in a Site Log Book (this SWPPP). The Site Log Book (this SWPPP) will be maintained for on Site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements,
- Site inspection notes, monitoring forms and associated Site Inspection Checklist, and
- DMRs.

For convenience, the inspection form and water quality monitoring forms (Appendices F and G) included in this SWPPP include the required information for the Site Log Book.

A report of inspections, including the name and qualifications of the CESCL inspector, date of inspection, observations and required actions will be prepared and retained in the project files as part of the SWPPP for at least three years from the date the Site is finally stabilized. The report will include any incidents of non-compliance or, if none occurred, will contain certification that the project is in compliance. Inspection reports will be maintained on Site with the SWPPP.

5.1. Site Inspection

BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. The inspector will be a CESCL per BMP C160 (Appendix B). The name and contact information for the CESCL is provided in Section 4.2 of this SWPPP.

Site inspection will occur in areas disturbed by construction activities. Project water will be monitored per requirements in Section S3 of the CSWGP (Appendix E). In addition, water samples

will be collected from the temporary water management system and tested as required by the City SAD permit prior to discharge to the City sanitary sewer system (Appendix F). Note that "Discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), groundwater quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health based criteria in the National Toxics Rule (40 CFR Part 131.36)." Discharges not in compliance with these standards are not authorized.

Project water that is pumped into the temporary water management system will be sampled and tested in accordance with the City SAD permit. Water will not be discharged to the City sanitary sewer system until compliance with the SAD permit effluent requirements has been achieved. The Site CESCL inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair, replace or add any of the BMPs. Maintenance, repairs and additions will be documented in the Site Log Book (this SWPPP). New BMPs or design changes will be documented in the SWPPP as soon as possible.

5.1.1. Site Inspection Frequency

For the duration of the remediation activities, Site inspections will be conducted weekly or within 24 hours of a rain event (during business hours) to ensure that excavation activities are complying with this SWPPP. A Department of Ecology Site Inspection Checklist will be filled out weekly and stored in Appendix J of the SWPPP. Recommendations for changes or improvements noted on the inspection checklist will be implemented within seven days after the Site visit.

5.1.2. Site Inspection Documentation

Monitoring personnel will record results of Site inspections each week on the approved Construction Stormwater Site Inspection Checklist (Appendix G). Copies of completed Site Inspection Checklists and Monitoring Data Sheets will be stored in Appendix J.

5.2. Project Water Quality Monitoring

Project water at the Site will be contained, collected, and monitored for the chemical analytical requirements in the City SAD permit prior to discharge to the City sanitary sewer. Water will be treated if necessary as determined by the chemical analytical results. Water samples will be collected by CESCL and submitted to a laboratory that meets certification set forth by the Department of Ecology. Sample bottles for each water sample will be supplied by the laboratory.

5.2.1. Project Water Management During Remediation

Discharges of any project water, including stormwater, are not authorized beyond the Site project boundaries. Therefore, all project water will be contained and managed on-site for discharge to the City sanitary sewer system in accordance with the City SAD permit.

5.2.2. Project Water Management Post Remediation

Upon completion of the remedial excavations, Site soil capping and Site restoration activities, surface flows over the clean capping materials may be allowed to leave the Site boundaries. Vegetated areas on the west side of the Site will act as a buffering filter strip where potential turbid water are anticipated to infiltrate into the ground before leaving the Site (parcel) boundaries and before entering Waters of the State (as defined in RCW 90.48.020). Surface water that sheet flows

across the temporary asphalt road to the new Site stormwater catch basins and filter systems will enter into the City stormwater drain system, which ultimately discharges to the Foss.

Final restoration inspection results will be described in the Site Log Book and in the final monthly DMRs as described in Section 6.0 of this SWPPP.

6.0 REPORTING AND RECORDKEEPING

6.1. Recordkeeping

Monitoring includes visual inspection, measurement of water quality COCs and documentation of the inspection and monitoring findings within the Site Inspection Checklist (Appendix J). Forms will be completed during each Site visit and will serve as the SWPPP record of observation and inspection. A monthly DMR (Appendix H) will be submitted to Ecology, as detailed in Section 6.4.1.

A Site Log Book (this SWPPP) will be maintained for on-site construction activities and will include:

- Construction Stormwater Site Inspection Checklists,
- Monthly Discharge Monitoring Reports, and
- Records of any changes to the SWPPP.

Records of monitoring information (Construction Stormwater Site Inspection Checklist, photos, etc.) and this SWPPP will be retained during the life of the project and for a minimum of three years following the completion of construction activities.

6.2. Updating the SWPPP

This SWPPP will be modified if recommended methods are ineffective in containing all project water on Site or there has been a change in design, construction, operation, or maintenance at the Site that has a significant effect on the potential for discharge, of pollutants outside of the Site. The SWPPP will be modified and BMPs will be implemented within seven days.

6.3. Access to Plans and Records

The SWPPP, CSWGP, Notice of Authorization letter, and Site Log Book will be retained on Site or within reasonable access to the Site and will be made immediately available upon request to Ecology or the local jurisdiction. Any information requested by Ecology will be submitted within a reasonable time. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with Section S5.G of the CSWGP (Appendix E).

6.4. Reporting

The Site is greater than 1 acre in size, and is therefore subject to the general water quality monitoring and reporting requirements set forth in the CSWGP (Appendix E).

The Site project water will not discharge to a water body listed as impaired under Section 303(d) of the Clean Water Act, therefore the Site is not subject to specific water quality requirements listed

under Section 303(d) http://apps.ecy.wa.gov/wqawa2008/viewer.htm, (http://www.ecy.wa.gov/programs/wq/stormwater/construction/impaired.html#snohomish).

6.4.1. Discharge Monitoring Reports

DMRs will be submitted to Ecology electronically using Ecology's WebDMR program 15 days following the end of each month (http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html).

If the contractor is unable to submit DMRs electronically, the contractor will contact Ecology to request a waiver and obtain instructions on how to mail a paper copy DMR. Water quality sampling results will be submitted to Ecology monthly with the DMR in accordance with permit condition S5.B (Ecology, 2005b). Because no discharges of stormwater are expected to be occurring, DMRs are anticipated to be submitted with the words "no discharge" entered in place of the monitoring results.

6.4.2. Notification of Noncompliance

- If any of the terms and conditions of the permit are not met, and it causes a threat to human health or the environment, the following steps will be taken in accordance with Section S5.F of the CSWGP (Appendix E). Ecology will be notified immediately of the failure to comply.
  - Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
  - A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

6.4.3. Permit Applications and Changes

In accordance with Condition S2.A of the CSWGP (Appendix E), a complete Notice of Intent application will be submitted to Ecology to be covered by the CSWGP.

7.0 REFERENCES

Washington State Department of Ecology (Ecology, 2011). Construction Stormwater General Permit. National Pollution Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity. Washington Department of Ecology. Olympia, Washington. http://www.ecy.wa.gov/programs/wq/Stormwater/construction/constructionfinalpermit.pdf

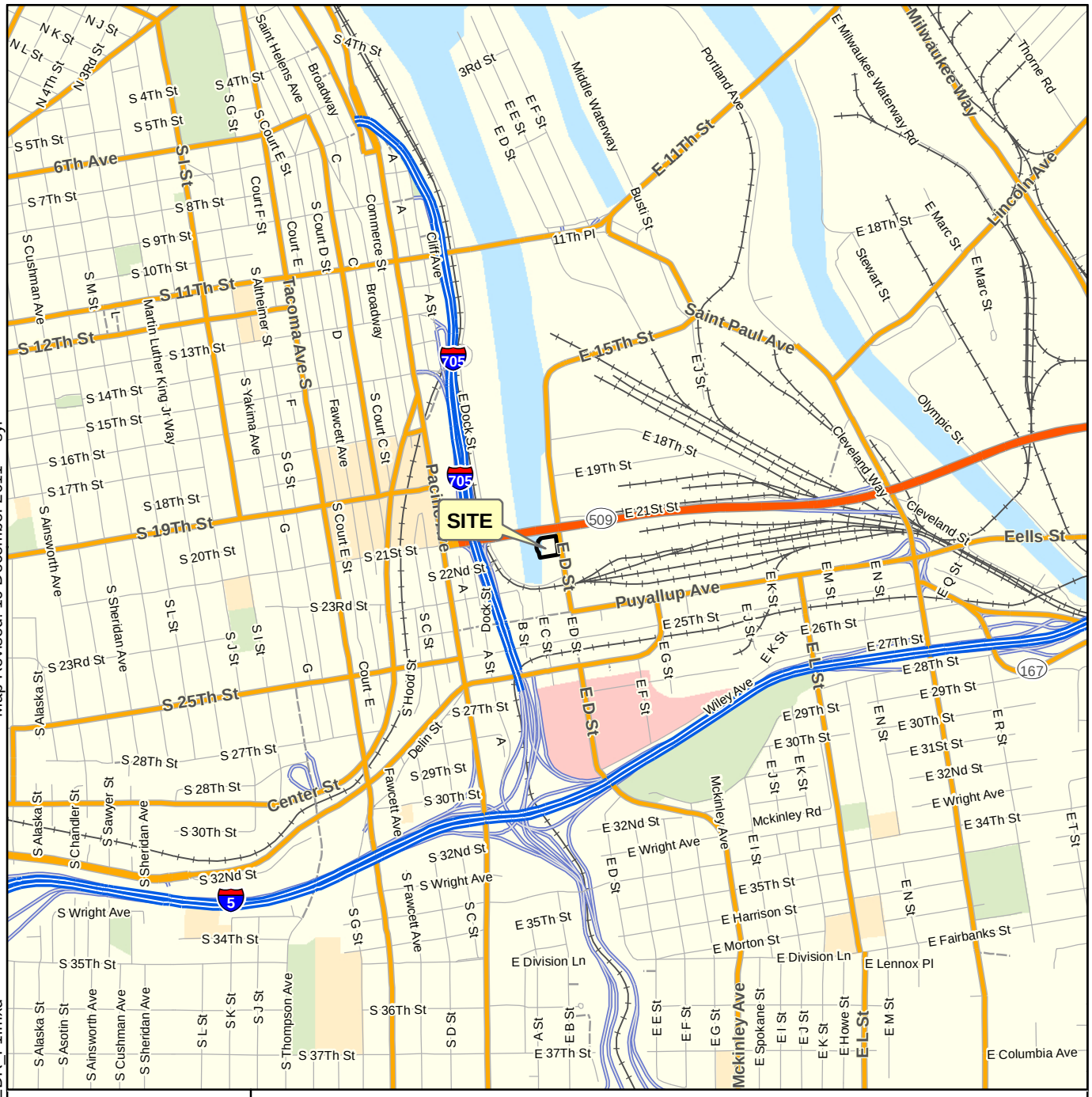
Washington State Department of Ecology (Ecology, 2005a). Stormwater Management Manual for Western Washington. Volume II. Construction Stormwater Pollution Prevention. Washington State Department of Ecology, Water Quality Program. Ecology Publication No. 05-10-030 (revision of No. 99-12). Olympia, Washington.

Washington State Department of Ecology (Ecology 2005b). Stormwater Management Manual for Western Washington. Volume IV. Source Control BMPs. Washington State Department of

Ecology, Water Quality Program. Ecology Publication No. 05-10-032 (revision of No. 99-12). Olympia, Washington.

GeoEngineers, Inc. (GeoEngineers, 2011). Draft Engineering Design Report. American Plating Site, 2110 East D Street, Tacoma, Washington. For Foss Waterway Development Authority. GEI File No. 10751-002-01. December 22, 2011.

GeoEngineers, Inc. (GeoEngineers, 2003). Final Draft Cleanup Action Plan. Former American Plating, Inc., 2110 East D Street, Tacoma, Washington. For Thea Foss Waterway Development Authority. GEI File No. 10751-002-00. November 24, 2003.



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

Engineering Design Report
American Plating Site Remediation Project
Tacoma, Washington

GeoEngineers

Figure 1

Office: TAC Path: P:\10\10751002\GIS\1075100201_EDR_F1.mxd Map Revised: 16 December 2011 syi

APPENDIX A

Site Preparation and Demolition Site Plan Figure A-1 – Site Preparation and Demolition Details A-3 and A-3



LEGEND

- MW-2 LOCATED MONITORING WELL
- MW-1 UNLOCATED MONITORING WELL
- BOLLARD
- SIGN AS NOTED
- STORM CLEANOUT
- STORM CATCH BASIN
- FSTORM MANHOLE
- GAS VALVE
- GUY ANCHOR
- UTILITY POWER POLE
- JUNCTION BOX
- LUMINAIRE
- COMMUNICATIONS MANHOLE
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- ADJUSTED MANHOLE
- ABANDONED MANHOLE
- PARCEL BOUNDARY
- PROJECT BOUNDARY
- FENCE GATE
- WATER METER
- WATER MANHOLE
- WATER VALVE
- DECIDUOUS TREE AS NOTED
- GATE POST
- APPROXIMATE LOCATION OF NINE 55-GALLON STEEL DRUMS
- QWEST OT — QWEST OVERHEAD COMMUNICATION
- QWEST BT — QWEST BURIED CABLE LINE
- ST — STORM SEWER LINE
- BP — BURIED POWER LINE
- BT — BURIED CABLE LINE
- SS — SANITARY SEWER LINE
- GAS LINE
- W — WATER LINE
- T — COMMUNICATION LINE
- P — POWER LINE
- STORM LINE
- OH — OVERHEAD POWER
- OT — OVERHEAD COMMUNICATION
- X — FENCE
- PARCEL 8950001791 NOT FOR CONSTRUCTION
- CONTRACTOR SHALL NOT OPERATE HEAVY MACHINERY IN THIS AREA

TESC AND DEMOLITION LEGEND

- 2/C2.1 — IP — INLET SEDIMENT PROTECTION
- CL — CLEARING LIMITS
- 1/C2.1 — FF — FILTER FABRIC FENCE
- 3/C2.1 — CE — CONSTRUCTION ENTRANCE
- SL — SAWCUT LINE
- 8/C2.1 — PB — PROTECTION BARRIER
- DEMOLISH/REMOVE ASPHALT AND UNDERLYING BASE COURSE
- DEMOLISH CONCRETE SURFACES, FOUNDATIONS, AND FOOTINGS
- DEMOLISH/REMOVE VEGETATION, DEBRIS, TRASH, REMNANT ASPHALT PAVEMENT, CONCRETE AND WOOD

CONSTRUCTION SEQUENCE

1. ARRANGE AND ATTEND PRE-CONSTRUCTION MEETING WITH THE ENGINEER.
2. THE CONTRACTOR SHALL SURVEY EXISTING CONDITIONS AND FLAG THE CLEARING/PROJECT LIMITS.
3. ESTABLISH PROJECT WATER MANAGEMENT SYSTEM IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND CONTRACTOR'S APPROVED PLAN.
4. CONSTRUCT ALL TEMPORARY EROSION CONTROL BMPs. CONSTRUCT FILTER FABRIC FENCE WESTERN PROJECT BOUNDARY PROTECTION BARRIER, TEMPORARY INTERCEPTOR SWALES, AND TEMPORARY SEDIMENT TRAPS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PLANS. INSTALL INLET SEDIMENT PROTECTION IN EXISTING CATCH BASINS, INSTALL CONSTRUCTION ENTRANCE.
5. CLEAR AND GRUB IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PLANS.
6. DEMOLISH EXISTING SITE FEATURES IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PLANS.
7. MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE PROJECT SWPPP, CONSTRUCTION GENERAL STORMWATER PERMIT AND PROJECT SPECIFICATIONS AND PLANS.
8. EXCAVATE AREAS INDICATED FOR REMOVAL. ALL EXCAVATING AND GRADING SHALL BE DONE IN CONFORMANCE WITH THE PROJECT SPECIFICATIONS AND PLANS.
9. APPLY VISQUINE COVERING, STRAW MULCH, OR EQUAL TO AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE OR PERMANENTLY VEGETATED WITHIN 7 DAYS OF EXPOSURE DURING THE DRY SEASON, AND 2 DAYS OF EXPOSURE DURING THE WET SEASON. (OCTOBER 1 THROUGH APRIL 30)
10. CONSTRUCT IMPROVEMENTS, CONSTRUCT UTILITIES AND STORM DRAINAGE FEATURES, CONSTRUCT STORM DRAINAGE INLET PROTECTION FOR ALL CATCH BASINS SUBJECT TO SITE RUNOFF.
11. EXCAVATE / GRADE SITE IN ACCORDANCE WITH PROJECT SPECIFICATIONS AND GRADING PLAN.
12. RELOCATE EROSION CONTROL MEASURES OR INSTALL NEW MEASURES SO THAT, AS SITE CONDITIONS CHANGE, THE EROSION AND SEDIMENT CONTROL IS ALWAYS IN ACCORDANCE WITH THE PROJECT SWPPP, CONSTRUCTION GENERAL STORMWATER PERMIT AND PROJECT SPECIFICATIONS AND PLANS.
13. PERFORM SITE CAPPING IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PLANS, ENSURE SURFACE WATER IS POSITIVELY DIRECTED TOWARD STORMWATER CONTROL FACILITIES.
14. PERFORM SITE RESTORATION IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PLANS.
15. COMPLETE SITE STABILIZATION.
16. REMOVE THE REMAINING TEMPORARY EROSION CONTROL ITEMS ONCE SITE HAS BEEN STABILIZED AND UPON APPROVAL BY THE ENGINEER.

GENERAL DEMOLITION & CLEARING NOTES

1. DEMOLITION: IT IS THE INTENT OF THE WORK UNDER THIS CONTRACT TO INCLUDE THE DEMOLITION OF ALL EXISTING SITE FEATURES INCLUDING THEIR UNDERGROUND COMPONENTS AS INDICATED BY THIS DRAWING AND AS REQUIRED IN THE PROJECT SPECIFICATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FULLY REVIEW THE SITE CONDITIONS AND TO CORRELATE THEIR OBSERVATIONS WITH THE PROJECT WORK AND INCLUDE ALL NECESSARY DEMOLITION WHETHER SHOWN OR NOT AND INCLUDE ALL SUCH COSTS IN THE BASE BID.
2. CLEARING: IT IS THE INTENT OF THE WORK UNDER THIS CONTRACT TO INCLUDE ALL CLEARING NECESSARY TO COMPLETE ALL PROJECT WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FULLY REVIEW THE SITE CONDITIONS AND TO CORRELATE THEIR OBSERVATIONS WITH PROJECT WORK AND INCLUDE ALL NECESSARY CLEARING WHETHER SHOWN OR NOT AND INCLUDE ALL SUCH COSTS IN THE BASE BID.
3. CONTRACTOR TO PROTECT ALL EXISTING ONSITE AND ADJACENT UTILITIES, UNLESS OTHERWISE SPECIFICALLY INDICATED.
4. PRIOR TO CONSTRUCTION, CONTRACTOR TO ENSURE ALL PREVENTIVE TESC MEASURES ARE IN PLACE AND MAINTAINED TO CONTAIN SITE RUNOFF AND NOT ALLOW DISCHARGE TO ADJACENT PROPERTIES OR THE THEA FOSS WATERWAY IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
5. CONTRACTOR SHALL DISPOSE OF THE DEMOLISHED MATERIALS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
6. CONTRACTOR TO REMOVE AND HAUL DEMOLISHED MATERIALS TO ENGINEER APPROVED DISPOSAL FACILITIES.
7. CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EXISTING UTILITIES. IF CONFLICTS EXIST, THEN CONTRACTOR SHALL NOTIFY ENGINEER.
8. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETELY COORDINATE UTILITY DEMOLITION WITH NEW CONSTRUCTION.
9. CONTRACTOR SHALL PROTECT ALL VEGETATION AND TREES BEYOND THE CLEARING LIMITS FROM CONSTRUCTION DAMAGE.
10. CONTRACTOR SHALL COORDINATE PHASE AND SCHEDULE ALL PROJECT WORK TO MAINTAIN ACCESS TO BERG SCAFFOLDING OFFICE BUILDING AND MAIN STORAGE AREA THROUGHOUT ALL PROJECT WORK. ANY WORK THAT REQUIRES OBSTRUCTION OF ACCESS TO BERG SCAFFOLDING SHALL BE PERFORMED AND COMPLETED OUTSIDE OF BERG SCAFFOLDING HOURS OF OPERATION.
11. EXISTING ASPHALT ACCESS ROAD AND GRAVEL BASE COURSE MATERIAL TO BE DEMOLISHED AND REMOVED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
12. A MATERIAL MANAGEMENT AREA OR AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND PLAN DETAIL 7 SHEET C2.1. THIS AREA OR AREAS WILL BE USED TO TEMPORALLY STOCKPILE MATERIALS FOR DISPOSAL CHARACTERIZATION SAMPLING ACTIVITIES IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
13. CONSTRUCTION RELATED NOISE WILL BE LIMITED TO CITY-DESIGNATED WORK HOURS.
14. A PROJECT WATER MANAGEMENT SYSTEM SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS FOR USE IN TEMPORARY. STORAGE AND TREATMENT OF ALL PROJECT WATER PRODUCED OR RECOVERED DURING ALL PROJECT WORK. ALL TREATED PROJECT WATER WILL BE DISCHARGED TO THE CITY OF TACOMA SANITARY SEWER IN ACCORDANCE WITH THE SPECIAL DISCHARGE AUTHORIZATION PERMIT.
15. CONSTRUCT TEMPORARY INTERCEPTOR SWALE, SANDBAG CHECK DAM, AND/OR TEMPORARY SEDIMENT TRAPS AS NECESSARY TO CONTAIN ALL PROJECT AREA RUNOFF. RUNOFF COLLECTED IN THE SEDIMENT TRAP(S) WILL BE ROUTED TO THE PROJECT WATER MANAGEMENT SYSTEM.
16. ANY DAMAGE TO ADJACENT RIGHT-OF-WAYS AND PROPERTY IS AT THE EXPENSE OF THE CONTRACTOR. THE CONTRACTOR WILL RESTORE ADJACENT ROWS AND PROPERTY AT ITS SOLE EXPENSE IF DAMAGE OCCURS.
17. CONTRACTOR SHALL NOT ACCESS, STORE MATERIAL OR EQUIPMENT, OR PERFORM WORK IN ACCESS BELOW ORDINARY HIGH WATER.

DEMOLITION KEY NOTES

1. PROTECT EXISTING UTILITY.
2. PROTECT EXISTING POLE.
3. DEMOLISH CONCRETE SURFACES, FOUNDATIONS, AND FOOTINGS IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
4. REMOVE ECOLOGY BLOCKS AND REUSE FOR STOCKPILED MATERIAL MANAGEMENT AREAS.
5. CLEAR VEGETATION, DEBRIS, TRASH, REMNANT ASPHALT PAVEMENT, AND CONCRETE.
6. DEMOLISH 3' WIRE FENCE.
7. PROTECT EXISTING BUILDING.
8. DEMOLISH ASPHALT PAVEMENT.
9. REMOVE EXISTING CHAINLINK FENCE AS NEEDED TO COMPLETE PROJECT WORK. SALVAGE ALL FENCING, GATE HARDWARE AND FENCING HARDWARE TO RE-USED DURING SITE RESTORATION.
10. PROTECT EXISTING CONCRETE ENTRANCE.
11. DECOMMISSION MONITORING WELL IN ACCORDANCE WITH WAC 173-160.
12. INSTALL FILTER FENCE, WESTERN PROPERTY BOUNDARY PROTECTION BARRIER, INTERCEPTOR SWALE, CHECK DAMS, AND SEDIMENT TRAPS AD NEEDED TO CONTAIN ALL PROJECT WATER.
13. INSTALL TEMPORARY ASPHALT BARRIER ACROSS ASPHALT ACCESS ROAD, AS NECESSARY TO CONTAIN SURFACE WATER RUNOFF.
14. REMOVE EXISTING COTTONWOOD TREES IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
15. PROTECT EXISTING VAULT. RELOCATE VERTICALLY TO MATCH FINAL CAPPING GRADES.

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base CAD drawing provided by AHBL, dated 08-26-2011.

CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555

20 0 20 40
Scale in Feet

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GeoEngineers
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Community Planners
Land Surveyors
Neighbors
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AHBL
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2215 North 30th Street, Suite 300, Tacoma, WA 98403
253.383.2422 TEL
1200 Sixth Avenue, Suite 1620, Seattle, WA 98101

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED BY DATE
FIELD BOOKS

DATE	SCALE
12/22/11	AS NOTED
DESIGNED	CHECKED
DRAWN: S.C.Y.	PROJECT NAME: 10751-002-01
DRAWING NAME: 1075100201_C2.0	

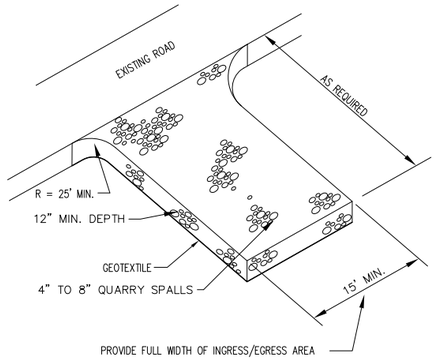
CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
CONSTRUCTION DIVISION

American Plating Site Remediation Project
Tacoma, Washington
Site Preparation and Demolition Plan

WORK ORDER NUMBER: TPD-XXXXX
SHEET NO. A-1
SHEET 1 OF 3

TACO:NER : SCY

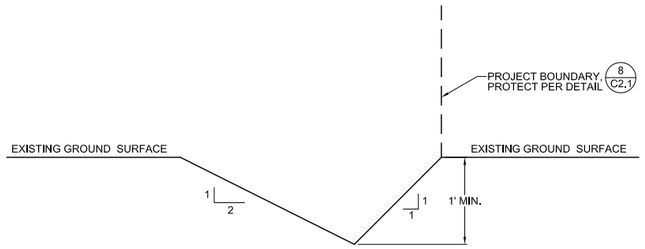
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CONSTRUCTION ENTRANCE NOTES

1. MATERIAL SHALL BE 4-INCH TO 8-INCH QUARRY SPALLS AND MAY BE TOP-DRESSED WITH 1-INCH TO 3-INCH ROCK. (WSDOT STANDARD SPECIFICATIONS, SECTION 8-15.)
2. THE ROCK PAD SHALL BE AT LEAST 12 INCHES THICK AND AS LONG AS REGULATED BY THE ENGINEER. WIDTH SHALL BE THE FULL WIDTH OF THE VEHICLE INGRESS AND EGRESS AREA.
3. ADDITIONAL ROCK SHALL BE ADDED PERIODICALLY TO MAINTAIN PROPER FUNCTION OF THE PAD.
4. IF THE PAD DOES NOT ADEQUATELY REMOVE THE MUD FROM THE VEHICLE WHEELS, THE WHEELS SHALL BE HOSED OFF BEFORE THE VEHICLE ENTERS A PAVED STREET. THE WASHING SHALL BE DONE ON AN AREA COVERED WITH CRUSHED ROCK AND WASH WATER SHALL DRAIN TO THE WATER MANAGEMENT SYSTEM.
5. GEOTEXTILE SHALL MEET THE FOLLOWING: GRAB TENSILE STRENGTH 200 PSI MIN. GRAB TENSILE LONGATION 30% MAX. MULLEN BURST STRENGTH 400 PSI MIN. AOS 2-45(U.S. STANDARD SIEVE)

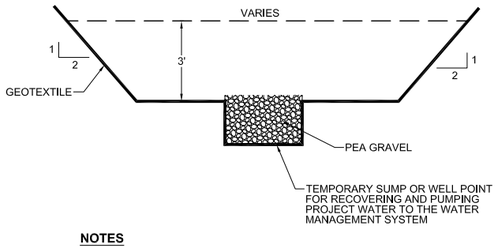
1 / C2.0 CONSTRUCTION ENTRANCE
(NOT TO SCALE)



4 / C2.0 TEMPORARY INTERCEPTOR SWALE
(NOT TO SCALE)

NOTES

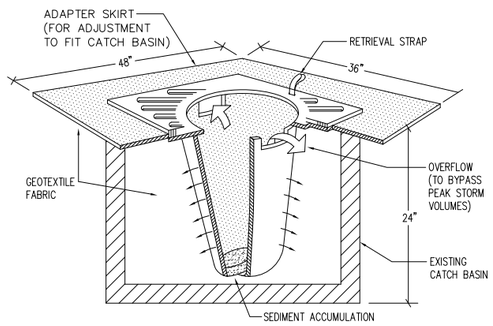
1. INTERCEPTOR SWALE(S) SHALL BE CONSTRUCTED TO CAPTURE AND CONTAIN ALL PROJECT SURFACE WATER. SWALES SHALL BE LOCATED ALONG THE PERIMETER BOUNDARY LIMITS.
2. SANDBAG CHECK DAMS SHALL BE INSTALLED WITHIN SWALES TO CONTROL SEDIMENTATION AND WATER FLOWS.
3. ALL SWALES SHALL BE ROUTED TO TEMPORARY SEDIMENT TRAP(S), AS NEEDED, TO CONTROL AND CONTAIN ALL PROJECT SURFACE WATER.



NOTES

1. TRAP MAY BE FORMED BY BERM OR BY PARTIAL OR COMPLETE EXCAVATION.
2. SEDIMENT TRAPS, ALONG WITH OTHER PERIMETER CONTROLS, SHALL BE INSTALLED BEFORE ANY LAND DISTURBANCE TAKES PLACE IN THE DRAINAGE AREA.
3. SEDIMENT SHALL BE REMOVED FROM THE TRAP BEFORE IT REACHES 1-FOOT IN DEPTH.
4. ANY DAMAGE TO THE TRAP EMBANKMENTS OR SLOPE SHALL BE REPAIRED IMMEDIATELY.

6 / C2.0 TEMPORARY SEDIMENT TRAP DETAIL
(NOT TO SCALE)



#3003 SEDIMENT ONLY

PROVIDE CATCH BASIN SEDIMENT PROTECTION WITH STREAMGUARD BASIN INSERT #3003, FROM FOSS ENVIRONMENTAL
7440 W. MARGINAL WAY S.
SEATTLE, WA 98108-4141
PHONE: 1-800-909-3677

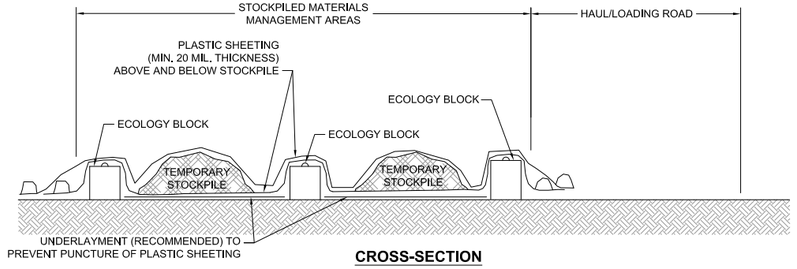
2 / C2.0 INLET SEDIMENT PROTECTION
(NOT TO SCALE)

SANDBAG CHECK DAM NOTES

1. SANDBAG CHECK DAMS SHALL BE 1' HIGH IN THE CENTER AND A MINIMUM OF 0.5' HIGHER ON THE SIDES.
2. CHECK DAMS SHALL BE TOED IN AT THE BASE A MINIMUM OF 0.5' TO PREVENT EROSION.
3. CHECK DAMS SHALL BE CONSTRUCTED IN SUCH A MANNER THAT THE SANDBAGS ARE FIRMLY PLACED WITH A MINIMUM OF SPACE BETWEEN BAGS.
4. CHECK DAMS SHOULD BE PLACED PERPENDICULAR TO THE FLOW OF WATER.
5. THE MAXIMUM SPACING BETWEEN THE DAMS SHALL BE SUCH THAT THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE TOP OF THE DOWNSTREAM DAM.
6. KEEP THE MAXIMUM HEIGHT AT 2 FEET AT THE CENTER OF THE DAM.
7. SANDBAG CHECK DAMS SHALL BE CONSTRUCTED OF APPROPRIATELY SIZED BAGS. THE BAGS MUST BE PLACED BY HAND OR BY MECHANICAL MEANS TO ACHIEVE COMPLETE COVERAGE OF THE DITCH OR SWALE AND TO ENSURE THAT THE CENTER OF THE DAM IS LOWER THAN THE EDGES. THE BAGS USED MUST BE LARGE ENOUGH TO STAY IN PLACE GIVEN THE EXPECTED DESIGN FLOW THROUGH THE CHANNEL.
8. CHECK DAMS SHALL BE MONITORED FOR PERFORMANCE AND SEDIMENT ACCUMULATION DURING AND AFTER EACH RUNOFF PRODUCING RAINFALL. SEDIMENT SHALL BE REMOVED BEFORE IT REACHES ONE HALF THE SUMP DEPTH.

DITCH SLOPE	CHECK DAM SPACING
0 – 5%	150 FEET
5 – 10%	100 FEET
10%	50 FEET

5 / C2.0 SANDBAG CHECK DAM DETAIL
(NOT TO SCALE)

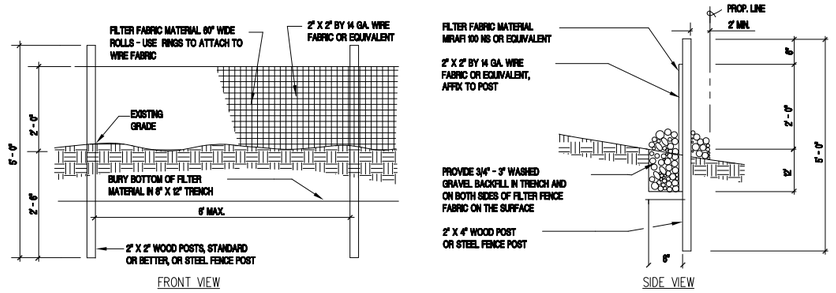


CROSS-SECTION

NOTES

1. STOCKPILED MATERIAL WILL BE COVERED AND SECURED FROM WIND, RAIN, AND OTHER DISTURBANCES AT ALL TIMES EXCEPT DURING ACTIVE MATERIAL LOADING AND UNLOADING.
2. EROSION CONTROL MEASURES, AS DESCRIBED ON SHEET C2.0 SHALL BE IN PLACE AT ALL TIMES DURING USE OF STOCKPILED MATERIAL MANAGEMENT AREAS.
3. WATER COLLECTED WITHIN THE AREAS MUST BE CONTAINED AS DESCRIBED IN THE PROJECT SPECIFICATIONS AND SWPPP. CONTRACTOR SHALL REMOVE WATER WITHIN THE AREAS BY PUMPING TO THE PROJECT WATER MANAGEMENT SYSTEM FOR TREATMENT AND ANALYSIS PRIOR TO DISPOSAL IN ACCORDANCE WITH THE SPECIAL DISCHARGE AUTHORIZATION. CONTRACTOR SHALL BE RESPONSIBLE FOR WATER COLLECTION IN THE STOCKPILED MATERIAL MANAGEMENT AREAS.

7 / C2.0 STOCKPILED MATERIALS MANAGEMENT AREAS DETAIL
(NOT TO SCALE)

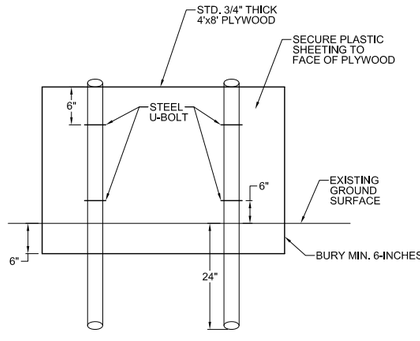


FILTER FABRIC FENCE NOTES

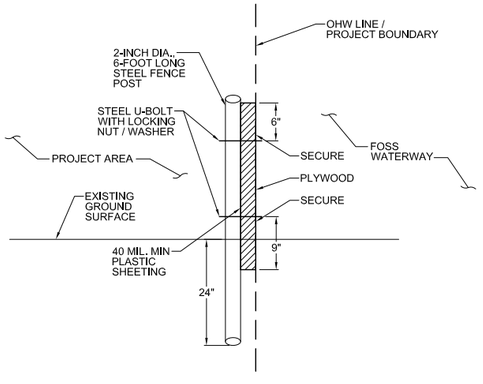
1. FILTER FABRIC FENCE SHALL BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY FASTENED AT BOTH ENDS TO POSTS.
2. POST SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 30 INCHES).
3. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 8 INCHES WIDE AND 12 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER. THIS TRENCH SHALL BE BACKFILLED WITH WASHED GRAVEL.
4. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES OR HOG RINGS. THE WIRE MESH SHALL EXTEND INTO THE TRENCH A MINIMUM OF 4 INCHES THE FILTER FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 24 INCHES.
5. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND NOT EXTEND MORE THAN 24 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
6. WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING IS USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISIONS OF ABOVE NOTES APPLYING.
7. FILTER FABRIC FENCES SHALL NOT BE REMOVED BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
8. FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
9. SILT FENCES WILL BE INSTALLED PARALLEL TO ANY SLOPE CONTOURS.
10. INSTALL DOWN SLOPE OF EXPOSED AREAS.
11. DO NOT DRIVE OVER OR FILL OVER SILT FENCES.

3 / C2.0 FILTER FABRIC FENCE
(NOT TO SCALE)

FRONT VIEW



SIDE VIEW



NOTES

1. PLYWOOD SHALL BE OVERLAPPED A MINIMUM OF 3-INCHES BETWEEN EACH PLYWOOD SHEET. PLYWOOD SHALL BE BURIED A MINIMUM OF 6-INCHES BELOW GROUND SURFACE.
2. ALL PROJECT WATER, DEBRIS, SOIL, OR ANY OTHER PROJECT-RELATED MATERIALS WILL BE CONTAINED BY THIS WESTERN BOUNDARY PROTECTION BARRIER. ANY DAMAGE OR RELEASE BEYOND THIS BARRIER WILL BE AT THE CONTRACTOR'S SOLE EXPENSE.
3. THIS BARRIER SHALL REMAIN IN PLACE DURING ALL PROJECT WORK AND UNTIL THE SITE IS FULLY STABILIZED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, SWPPP AND RESTORATION PLAN.
4. THE CONTRACTOR SHALL PREVENT ALL PROJECT WORK FROM DAMAGING THIS BARRIER DURING ALL PROJECT WORK.
5. WRAP AND SECURE THE PLASTIC SHEETING OVER THE ENTIRE PLYWOOD FACE.

8 / C2.0 WESTERN PROJECT BOUNDARY PROTECTION BARRIER DETAIL
(NOT TO SCALE)

CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555

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Fax (253) 383-4923

Structural Engineers
Landscape Architects
Community Planners
Land Surveyors
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TACOMA · SEATTLE
2215 North 30th Street, Suite 300, Tacoma, WA 98403
253.383.2422 TEL
1200 Sixth Avenue, Suite 1620, Seattle, WA 98101

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED	DATE 12/22/11	SCALE AS NOTED	
BY	DESIGNED	CHECKED	
DATE	DRAWN S.C.Y.	PROJECT NAME 10751-002-01	
FIELD BOOKS	DRAWING NAME 1075100201_C2.1		

CONSTRUCTION DIVISION

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

American Plating Site Remediation Project
Tacoma, Washington
Site Preparation and Demolition Plan Details

WORK ORDER NUMBER TPD-XXXXX
SHEET NO. A-2
SHEET 2 OF 3

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TACO:NER : SCY

GENERAL EROSION CONTROL NOTES

1. THE IMPLEMENTATION OF THESE TESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION / LANDSCAPING IS ESTABLISHED.
2. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING ALL PROJECT WORK, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF ALL PROJECT WORK.
3. THE TESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER IS CONTAINED ONSITE.
4. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER IS CONTAINED ONSITE.
5. THE TESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
6. THE TESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A WEEK OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
7. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN SEDIMENT TRAP. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM SYSTEM.
8. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF ALL PROJECT WORK.
9. TEMPORARY STORAGE AREAS SHOULD BE LOCATED AWAY FROM VEHICULAR TRAFFIC, NEAR THE CONSTRUCTION ENTRANCE, AND AWAY FROM WATERWAYS OR STORM DRAINS.
10. MATERIAL SAFETY DATA SHEETS (MSDS) SHOULD BE SUPPLIED FOR ALL MATERIALS STORED. CHEMICALS SHOULD BE KEPT IN THEIR ORIGINAL LABELED CONTAINERS.
11. HAZARDOUS MATERIAL STORAGE ON-SITE SHOULD BE MINIMIZED.
12. HAZARDOUS MATERIALS SHOULD BE HANDLED AS INFREQUENTLY AS POSSIBLE.
13. DURING THE WET WEATHER SEASON (OCT 1 - APRIL 30), CONSIDER STORING MATERIALS IN A COVERED AREA.
14. MATERIALS SHOULD BE STORED IN SECONDARY CONTAINMENTS, SUCH AS EARTHEN DIKE, HORSE TROUGH, OR EVEN A CHILDREN'S WADING POOL FOR NON-REACTIVE MATERIALS SUCH AS DETERGENTS, OIL, GREASE, AND PAINTS. SMALL AMOUNTS OF MATERIAL MAY BE SECONDARILY IN "BUS BOY" TRAYS OR CONCRETE MIXING TRAYS.
15. DO NOT STORE CHEMICALS, DRUMS, OR BAGGED MATERIALS DIRECTLY ON THE GROUND. PLACE THESE ITEMS ON A PALLET AND, WHEN POSSIBLE, IN SECONDARY CONTAINMENT.

SECONDARY CONTAINMENT PRACTICES

1. LIQUIDS, PETROLEUM PRODUCTS, AND SUBSTANCES LISTED IN 40 CFR PARTS 110, 117, OR 302 SHALL BE STORED IN APPROVED CONTAINERS AND DRUMS AND SHALL NOT BE OVERFILLED. CONTAINERS AND DRUMS SHALL BE STORED IN TEMPORARY SECONDARY CONTAINMENT FACILITIES.
2. TEMPORARY SECONDARY CONTAINMENT FACILITIES SHALL PROVIDE FOR A SPILL CONTAINMENT VOLUME ABLE TO CONTAIN PRECIPITATION FROM A 25 YEAR, 24 HOUR STORM EVENT, PLUS 10% OF THE TOTAL ENCLOSED CONTAINER VOLUME OF ALL CONTAINERS, OR 110% OF THE CAPACITY OF THE LARGEST CONTAINER WITHIN ITS BOUNDARY, WHICHEVER IS GREATER.
3. TEMPORARY SECONDARY CONTAINMENT FACILITIES SHALL BE IMPERVIOUS TO THE MATERIALS STORED THEREIN FOR A MINIMUM CONTACT TIME OF 72 HOURS.
4. TEMPORARY SECONDARY CONTAINMENT FACILITIES SHALL BE MAINTAINED FREE OF ACCUMULATED RAINWATER AND SPILLS. IN THE EVENT OF SPILLS OR LEAKS, ACCUMULATED RAINWATER AND SPILLS SHALL BE COLLECTED AND PLACED INTO DRUMS. THESE LIQUIDS SHALL BE HANDLED AS HAZARDOUS WASTE UNLESS TESTING DETERMINES THEM TO BE NON-HAZARDOUS.
5. SUFFICIENT SEPARATION SHOULD BE PROVIDED BETWEEN STORED CONTAINERS TO ALLOW FOR SPILL CLEANUP AND EMERGENCY RESPONSE ACCESS.
6. DURING THE WET WEATHER SEASON (OCT 1 - APRIL 30), EACH SECONDARY CONTAINMENT FACILITY SHALL BE COVERED DURING NON-WORKING DAYS, PRIOR TO AND DURING RAIN EVENTS.
7. KEEP MATERIAL STORAGE AREAS CLEAN, ORGANIZED AND EQUIPPED WITH AN AMPLE SUPPLY OF APPROPRIATE SPILL CLEAN-UP MATERIAL (MINIMUM 3 SPILL KIT).
8. SPILL KITS SHOULD INCLUDE, AT A MINIMUM:
   - 1-WATER RESISTANT NYLON BAG
   - 3-OIL ABSORBENT SOCKS 3"x4'
   - 2-OIL ABSORBENT SOCKS 3"x10'
   - 12-OIL ABSORBENT SOCKS 17"x19"
   - 1-PAIR SPLASH RESISTANT GOGGLES
   - 3-PAIR NITRILE GLOVES
   - 10-DISPOSABLE BAGS WITH TIES
   - INSTRUCTIONS

CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555

DRAFT - NOT FOR CONSTRUCTION

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Fax (253) 383-4923

Structural Engineers
Landscape Architects
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Land Surveyors
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2215 North 30th Street, Suite 300, Tacoma, WA 98403
253.383.2422 TEL
1200 Sixth Avenue, Suite 1620, Seattle, WA 98101

Tacoma

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED
BY
DATE
FIELD BOOKS

DATE 12/22/11 | SCALE AS NOTED
DESIGNED | CHECKED
DRAWN S.C.Y. | PROJECT NAME 10751-002-01
DRAWING NAME 1075100201_C2.2

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
CONSTRUCTION DIVISION

American Plating Site Remediation Project
Tacoma, Washington
Site Preparation and Demolition Plan Details

WORK ORDER NUMBER TPD-XXXXX
SHEET NO. A-3
SHEET 3 OF 3

TACO:NER : SCY
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APPENDIX B
Required BMPs

BMP C103: High Visibility Plastic or Metal Fence

Purpose

Fencing is intended to: (1) restrict clearing to approved limits; (2) prevent disturbance of sensitive areas, their buffers, and other areas required to be left undisturbed; (3) limit construction traffic to designated construction entrances or roads; and, (4) protect areas where marking with survey tape may not provide adequate protection.

Conditions of Use

To establish clearing limits, plastic or metal fence may be used:

- At the boundary of sensitive areas, their buffers, and other areas required to be left uncleared.
- As necessary to control vehicle access to and on the site.

Design and Installation Specifications

- High visibility plastic fence shall be composed of a high-density polyethylene material and shall be at least four feet in height. Posts for the fencing shall be steel or wood and placed every 6 feet on center (maximum) or as needed to ensure rigidity. The fencing shall be fastened to the post every six inches with a polyethylene tie. On long continuous lengths of fencing, a tension wire or rope shall be used as a top stringer to prevent sagging between posts. The fence color shall be high visibility orange. The fence tensile strength shall be 360 lbs./ft. using the ASTM D4595 testing method.
- Metal fences shall be designed and installed according to the manufacturer's specifications.
- Metal fences shall be at least 3 feet high and must be highly visible.
- Fences shall not be wired or stapled to trees.

Maintenance Standards

- If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

BMP C105: Stabilized Construction Entrance

Purpose

Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by vehicles or equipment by constructing a stabilized pad of quarry spalls at entrances to construction sites.

Conditions of Use

Construction entrances shall be stabilized wherever traffic will be leaving a construction site and traveling on paved roads or other paved areas within 1,000 feet of the site.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized entrances not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

Design and Installation Specifications

- See Figure 4.2 for details. Note: the 100' minimum length of the entrance shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').
- A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the following standards:

Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will paved; this can be used as a stabilized entrance. Also consider the installation of excess concrete as a stabilized entrance. During large concrete pours, excess concrete is often available for this purpose.
- Hog fuel (wood-based mulch) may be substituted for or combined with quarry spalls in areas that will not be used for permanent roads. Hog fuel is generally less effective at stabilizing construction entrances and should be used only at sites where the amount of traffic is very limited. Hog fuel is not recommended for entrance stabilization in urban areas. The effectiveness of hog fuel is highly variable and it generally requires more maintenance than quarry spalls. The inspector may at any time require the use of quarry spalls if the hog fuel is not preventing sediment from being tracked onto pavement or if the hog fuel is being carried onto pavement. Hog fuel is prohibited in permanent roadbeds because organics in the subgrade soils cause degradation of the subgrade support over time.
- Fencing (see BMPs C103 and C104) shall be installed as necessary to restrict traffic to the construction entrance.

- Whenever possible, the entrance shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.

Maintenance Standards

- Quarry spalls (or hog fuel) shall be added if the pad is no longer in accordance with the specifications.
- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMPs C103 and C104) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

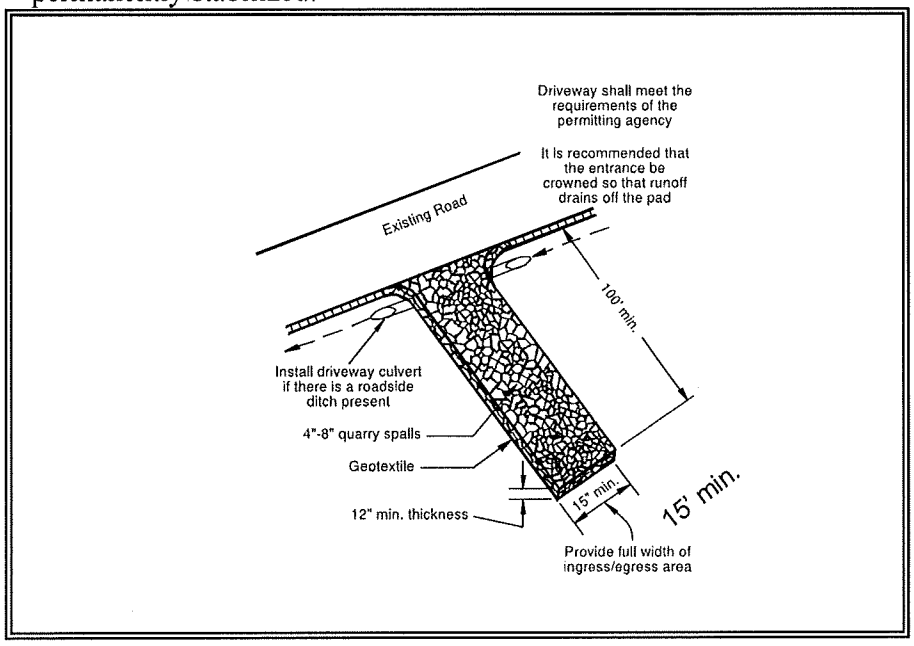


Figure 4.2 – Stabilized Construction Entrance

BMP C107: Construction Road/Parking Area Stabilization

Purpose

Stabilizing subdivision roads, parking areas, and other onsite vehicle transportation routes immediately after grading reduces erosion caused by construction traffic or runoff.

Conditions of Use

- Roads or parking areas shall be stabilized wherever they are constructed, whether permanent or temporary, for use by construction traffic.
- Fencing (see BMPs C103 and C104) shall be installed, if necessary, to limit the access of vehicles to only those roads and parking areas that are stabilized.

Design and Installation Specifications

- On areas that will receive asphalt as part of the project, install the first lift as soon as possible.
- A 6-inch depth of 2- to 4-inch crushed rock, gravel base, or crushed surfacing base course shall be applied immediately after grading or utility installation. A 4-inch course of asphalt treated base (ATB) may also be used, or the road/parking area may be paved. It may also be possible to use cement or calcium chloride for soil stabilization. If cement or cement kiln dust is used for roadbase stabilization, pH monitoring and BMPs are necessary to evaluate and minimize the effects on stormwater. If the area will not be used for permanent roads, parking areas, or structures, a 6-inch depth of hog fuel may also be used, but this is likely to require more maintenance. Whenever possible, construction roads and parking areas shall be placed on a firm, compacted subgrade.
- Temporary road gradients shall not exceed 15 percent. Roadways shall be carefully graded to drain. Drainage ditches shall be provided on each side of the roadway in the case of a crowned section, or on one side in the case of a super-elevated section. Drainage ditches shall be directed to a sediment control BMP.
- Rather than relying on ditches, it may also be possible to grade the road so that runoff sheet-flows into a heavily vegetated area with a well-developed topsoil. Landscaped areas are not adequate. If this area has at least 50 feet of vegetation, then it is generally preferable to use the vegetation to treat runoff, rather than a sediment pond or trap. The 50 feet shall not include wetlands. If runoff is allowed to sheetflow through adjacent vegetated areas, it is vital to design the roadways and parking areas so that no concentrated runoff is created.
- Storm drain inlets shall be protected to prevent sediment-laden water entering the storm drain system (see BMP C220).

Maintenance Standards

- Inspect stabilized areas regularly, especially after large storm events.
- Crushed rock, gravel base, hog fuel, etc. shall be added as required to maintain a stable driving surface and to stabilize any areas that have eroded.
- Following construction, these areas shall be restored to pre-construction condition or better to prevent future erosion.

BMP C120: Temporary and Permanent Seeding

Purpose

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Conditions of Use

- Seeding may be used throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.
- Channels that will be vegetated should be installed before major earthwork and hydroseeded with a Bonded Fiber Matrix. The vegetation should be well established (i.e., 75 percent cover) before water is allowed to flow in the ditch. With channels that will have high flows, erosion control blankets should be installed over the hydroseed. If vegetation cannot be established from seed before water is allowed in the ditch, sod should be installed in the bottom of the ditch over hydromulch and blankets.
- Retention/detention ponds should be seeded as required.
- Mulch is required at all times because it protects seeds from heat, moisture loss, and transport due to runoff.
- All disturbed areas shall be reviewed in late August to early September and all seeding should be completed by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.
- At final site stabilization, all disturbed areas not otherwise vegetated or stabilized shall be seeded and mulched. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions or geotextiles) which will prevent erosion.

Design and Installation Specifications

- Seeding should be done during those seasons most conducive to growth and will vary with the climate conditions of the region. Local experience should be used to determine the appropriate seeding periods.
- The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1. Seeding that occurs between July 1 and August 30 will require irrigation until 75 percent grass cover is established. Seeding that occurs between October 1 and March 30 will require a mulch or plastic cover until 75 percent grass cover is established.
- To prevent seed from being washed away, confirm that all required surface water control measures have been installed.

- The seedbed should be firm and rough. All soil should be roughened no matter what the slope. If compaction is required for engineering purposes, slopes must be track walked before seeding. Backblading or smoothing of slopes greater than 4:1 is not allowed if they are to be seeded.
- New and more effective restoration-based landscape practices rely on deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical the subgrade should be initially ripped to improve long-term permeability, infiltration, and water inflow qualities. At a minimum, permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches the rototilling process should be done in multiple lifts, or the prepared soil system shall be prepared properly and then placed to achieve the specified depth.
- Organic matter is the most appropriate form of "fertilizer" because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form. A natural system typically releases 2-10 percent of its nutrients annually. Chemical fertilizers have since been formulated to simulate what organic matter does naturally.
- In general, 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer can be used at a rate of 90 pounds per acre. Slow-release fertilizers should always be used because they are more efficient and have fewer environmental impacts. It is recommended that areas being seeded for final landscaping conduct soil tests to determine the exact type and quantity of fertilizer needed. This will prevent the over-application of fertilizer. Fertilizer should not be added to the hydromulch machine and agitated more than 20 minutes before it is to be used. If agitated too much, the slow-release coating is destroyed.
- There are numerous products available on the market that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal is a good source of long-term, slow-release, available nitrogen.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 percent tackifier. Mulch may be made up of 100 percent: cottonseed meal; fibers made of wood, recycled cellulose, hemp, and kenaf; compost; or blends of these. Tackifier shall be plant-based, such as guar or alpha plantago, or chemical-based such as polyacrylamide or polymers. Any mulch or tackifier product used shall be installed per manufacturer's instructions. Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at time of application.

- Mulch is always required for seeding. Mulch can be applied on top of the seed or simultaneously by hydroseeding.
- On steep slopes, Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products should be used. BFM/MBFM products are applied at a minimum rate of 3,000 pounds per acre of mulch with approximately 10 percent tackifier. Application is made so that a minimum of 95 percent soil coverage is achieved. Numerous products are available commercially and should be installed per manufacturer's instructions. Most products require 24-36 hours to cure before a rainfall and cannot be installed on wet or saturated soils. Generally, these products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.

BFMs and MBFMs have some advantages over blankets:

- No surface preparation required;
- Can be installed via helicopter in remote areas;
- On slopes steeper than 2.5:1, blanket installers may need to be roped and harnessed for safety;
- They are at least $1,000 per acre cheaper installed.

In most cases, the shear strength of blankets is not a factor when used on slopes, only when used in channels. BFMs and MBFMs are good alternatives to blankets in most situations where vegetation establishment is the goal.

- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. One way to overcome this is to increase seed quantities by up to 50 percent.
- Vegetation establishment can also be enhanced by dividing the hydromulch operation into two phases:
    1. Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift;
    2. Phase 2- Install the rest of the mulch and tackifier over the first lift.

An alternative is to install the mulch, seed, fertilizer, and tackifier in one lift. Then, spread or blow straw over the top of the hydromulch at a rate of about 800-1000 pounds per acre. Hold straw in place with a standard tackifier. Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:

1. Irrigation
2. Reapplication of mulch
3. Repair of failed slope surfaces

This technique works with standard hydromulch (1,500 pounds per acre minimum) and BFM/MBFMs (3,000 pounds per acre minimum).

- Areas to be permanently landscaped shall provide a healthy topsoil that reduces the need for fertilizers, improves overall topsoil quality, provides for better vegetal health and vitality, improves hydrologic characteristics, and reduces the need for irrigation. This can be accomplished in a number of ways:

  Recent research has shown that the best method to improve till soils is to amend these soils with compost. The optimum mixture is approximately two parts soil to one part compost. This equates to 4 inches of compost mixed to a depth of 12 inches in till soils. Increasing the concentration of compost beyond this level can have negative effects on vegetal health, while decreasing the concentrations can reduce the benefits of amended soils. Please note: The compost should meet specifications for Grade A quality compost in Ecology Publication 94-038.

  Other soils, such as gravel or cobble outwash soils, may require different approaches. Organics and fines easily migrate through the loose structure of these soils. Therefore, the importation of at least 6 inches of quality topsoil, underlain by some type of filter fabric to prevent the migration of fines, may be more appropriate for these soils.

  Areas that already have good topsoil, such as undisturbed areas, do not require soil amendments.

- Areas that will be seeded only and not landscaped may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Native topsoil should be re-installed on the disturbed soil surface before application.
- Seed that is installed as a temporary measure may be installed by hand if it will be covered by straw, mulch, or topsoil. Seed that is installed as a permanent measure may be installed by hand on small areas (usually less than 1 acre) that will be covered with mulch, topsoil, or erosion blankets. The seed mixes listed below include recommended mixes for both temporary and permanent seeding. These mixes, with the exception of the wetland mix, shall be applied at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used. Local suppliers or the local conservation district should be consulted for their recommendations because the appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used.

Table 4.1 represents the standard mix for those areas where just a temporary vegetative cover is required.

Table 4.1
Temporary Erosion Control Seed Mix

	% Weight	% Purity	% Germination
Chewings or annual blue grass *Festuca rubra var. commutata* or *Poa anna*	40	98	90
Perennial rye - *Lolium perenne*	50	98	90
Redtop or colonial bentgrass *Agrostis alba* or *Agrostis tenuis*	5	92	85
White dutch clover *Trifolium repens*	5	98	90

Table 4.2 provides just one recommended possibility for landscaping seed.

Table 4.2
Landscaping Seed Mix

	% Weight	% Purity	% Germination
Perennial rye blend *Lolium perenne*	70	98	90
Chewings and red fescue blend *Festuca rubra var. commutata* or *Festuca rubra*	30	98	90

This turf seed mix in Table 4.3 is for dry situations where there is no need for much water. The advantage is that this mix requires very little maintenance.

Table 4.3
Low-Growing Turf Seed Mix

	% Weight	% Purity	% Germination
Dwarf tall fescue (several varieties) *Festuca arundinacea var.*	45	98	90
Dwarf perennial rye (Barclay) *Lolium perenne var. barclay*	30	98	90
Red fescue *Festuca rubra*	20	98	90
Colonial bentgrass *Agrostis tenuis*	5	98	90

Table 4.4 presents a mix recommended for bioswales and other intermittently wet areas.

Table 4.4
Bioswale Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	75-80	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	92	85
Redtop bentgrass *Agrostis alba* or *Agrostis gigantea*	5-10	90	80

* *Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix*

The seed mix shown in Table 4.5 is a recommended low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Other mixes may be appropriate, depending on the soil type and hydrology of the area. Recent research suggests that bentgrass (agrostis sp.) should be emphasized in wet-area seed mixes. Apply this mixture at a rate of 60 pounds per acre.

Table 4.5
Wet Area Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	60-70	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	98	85
Meadow foxtail *Alepocurus pratensis*	10-15	90	80
Alsike clover *Trifolium hybridum*	1-6	98	90
Redtop bentgrass *Agrostis alba*	1-6	92	85

* *Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix*

The meadow seed mix in Table 4.6 is recommended for areas that will be maintained infrequently or not at all and where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seeding should take place in September or very early October in order to obtain adequate establishment prior to the winter months. The appropriateness of clover in the mix may need to be considered, as this can be a fairly invasive species. If the soil is amended, the addition of clover may not be necessary.

Table 4.6
Meadow Seed Mix

	% Weight	% Purity	% Germination
Redtop or Oregon bentgrass *Agrostis alba* or *Agrostis oregonensis*	20	92	85
Red fescue *Festuca rubra*	70	98	90
White dutch clover *Trifolium repens*	10	98	90

Maintenance Standards

- Any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows) shall be reseeded. If reseeding is ineffective, an alternate method, such as sodding, mulching, or nets/blankets, shall be used. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.

- After adequate cover is achieved, any areas that experience erosion shall be reseeded and protected by mulch. If the erosion problem is drainage related, the problem shall be fixed and the eroded area reseeded and protected by mulch.
- Seeded areas shall be supplied with adequate moisture, but not watered to the extent that it causes runoff.

BMP C121: Mulching

Purpose

The purpose of mulching soils is to provide immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There is an enormous variety of mulches that can be used. Only the most common types are discussed in this section.

Conditions of Use

As a temporary cover measure, mulch should be used:

- On disturbed areas that require cover measures for less than 30 days.
- As a cover for seed during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.
- Mulch may be applied at any time of the year and must be refreshed periodically.

Design and Installation Specifications

For mulch materials, application rates, and specifications, see Table 4.7. Note: Thicknesses may be increased for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter. Composted organic materials have higher specific gravities (densities) than straw, wood, or chipped material.

Maintenance Standards

- The thickness of the cover must be maintained.
- Any areas that experience erosion shall be remulched and/or protected with a net or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

Table 4.7
Mulch Standards and Guidelines

Mulch Material	Quality Standards	Application Rates	Remarks
Straw	Air-dried; free from undesirable seed and coarse material.	2"-3" thick; 5 bales per 1000 sf or 2-3 tons per acre	Cost-effective protection when applied with adequate thickness. Hand-application generally requires greater thickness than blown straw. The thickness of straw may be reduced by half when used in conjunction with seeding. In windy areas straw must be held in place by crimping, using a tackifier, or covering with netting. Blown straw always has to be held in place with a tackifier as even light winds will blow it away. Straw, however, has several deficiencies that should be considered when selecting mulch materials. It often introduces and/or encourages the propagation of weed species and it has no significant long-term benefits. Straw should be used only if mulches with long-term benefits are unavailable locally. It should also not be used within the ordinary high-water elevation of surface waters (due to flotation).
Hydromulch	No growth inhibiting factors.	Approx. 25-30 lbs per 1000 sf or 1500 - 2000 lbs per acre	Shall be applied with hydromulcher. Shall not be used without seed and tackifier unless the application rate is at least doubled. Fibers longer than about ¾-1 inch clog hydromulch equipment. Fibers should be kept to less than ¾ inch.
Composted Mulch and Compost	No visible water or dust during handling. Must be purchased from supplier with Solid Waste Handling Permit (unless exempt).	2" thick min.; approx. 100 tons per acre (approx. 800 lbs per yard)	More effective control can be obtained by increasing thickness to 3". Excellent mulch for protecting final grades until landscaping because it can be directly seeded or tilled into soil as an amendment. Composted mulch has a coarser size gradation than compost. It is more stable and practical to use in wet areas and during rainy weather conditions.
Chipped Site Vegetation	Average size shall be several inches. Gradations from fines to 6 inches in length for texture, variation, and interlocking properties.	2" minimum thickness	This is a cost-effective way to dispose of debris from clearing and grubbing, and it eliminates the problems associated with burning. Generally, it should not be used on slopes above approx. 10% because of its tendency to be transported by runoff. It is not recommended within 200 feet of surface waters. If seeding is expected shortly after mulch, the decomposition of the chipped vegetation may tie up nutrients important to grass establishment.
Wood-based Mulch	No visible water or dust during handling. Must be purchased from a supplier with a Solid Waste Handling Permit or one exempt from solid waste regulations.	2" thick; approx. 100 tons per acre (approx. 800 lbs. per cubic yard)	This material is often called "hog or hogged fuel." It is usable as a material for Stabilized Construction Entrances (BMP C105) and as a mulch. The use of mulch ultimately improves the organic matter in the soil. Special caution is advised regarding the source and composition of wood-based mulches. Its preparation typically does not provide any weed seed control, so evidence of residual vegetation in its composition or known inclusion of weed plants or seeds should be monitored and prevented (or minimized).

BMP C123: Plastic Covering

Purpose

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

Conditions of Use

- Plastic covering may be used on disturbed areas that require cover measures for less than 30 days, except as stated below.
- Plastic is particularly useful for protecting cut and fill slopes and stockpiles. Note: The relatively rapid breakdown of most polyethylene sheeting makes it unsuitable for long-term (greater than six months) applications.
- Clear plastic sheeting can be used over newly-seeded areas to create a greenhouse effect and encourage grass growth if the hydroseed was installed too late in the season to establish 75 percent grass cover, or if the wet season started earlier than normal. Clear plastic should not be used for this purpose during the summer months because the resulting high temperatures can kill the grass.
- Due to rapid runoff caused by plastic sheeting, this method shall not be used upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.
- While plastic is inexpensive to purchase, the added cost of installation, maintenance, removal, and disposal make this an expensive material, up to $1.50-2.00 per square yard.
- Whenever plastic is used to protect slopes, water collection measures must be installed at the base of the slope. These measures include plastic-covered berms, channels, and pipes used to covey clean rainwater away from bare soil and disturbed areas. At no time is clean runoff from a plastic covered slope to be mixed with dirty runoff from a project.
- Other uses for plastic include:
    1. Temporary ditch liner;
    2. Pond liner in temporary sediment pond;
    3. Liner for bermed temporary fuel storage area if plastic is not reactive to the type of fuel being stored;
    4. Emergency slope protection during heavy rains; and,
    5. Temporary drainpipe ("elephant trunk") used to direct water.

BMP C140: Dust Control

Purpose

Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters.

Conditions of Use

- In areas (including roadways) subject to surface and air movement of dust where on-site and off-site impacts to roadways, drainage ways, or surface waters are likely.

Design and Installation Specifications

- Vegetate or mulch areas that will not receive vehicle traffic. In areas where planting, mulching, or paving is impractical, apply gravel or landscaping rock.
- Limit dust generation by clearing only those areas where immediate activity will take place, leaving the remaining area(s) in the original condition, if stable. Maintain the original ground cover as long as practical.
- Construct natural or artificial windbreaks or windscreens. These may be designed as enclosures for small dust sources.
- Sprinkle the site with water until surface is wet. Repeat as needed. To prevent carryout of mud onto street, refer to Stabilized Construction Entrance (BMP C105).
- Irrigation water can be used for dust control. Irrigation systems should be installed as a first step on sites where dust control is a concern.
- Spray exposed soil areas with a dust palliative, following the manufacturer's instructions and cautions regarding handling and application. Used oil is prohibited from use as a dust suppressant. Local governments may approve other dust palliatives such as calcium chloride or PAM.
- PAM (BMP C126) added to water at a rate of 0.5 lbs. per 1,000 gallons of water per acre and applied from a water truck is more effective than water alone. This is due to the increased infiltration of water into the soil and reduced evaporation. In addition, small soil particles are bonded together and are not as easily transported by wind. Adding PAM may actually reduce the quantity of water needed for dust control, especially in eastern Washington. Since the wholesale cost of PAM is about $ 4.00 per pound, this is an extremely cost-effective dust control method.

Techniques that can be used for unpaved roads and lots include:

- Lower speed limits. High vehicle speed increases the amount of dust stirred up from unpaved roads and lots.
- Upgrade the road surface strength by improving particle size, shape, and mineral types that make up the surface and base materials.

- Add surface gravel to reduce the source of dust emission. Limit the amount of fine particles (those smaller than .075 mm) to 10 to 20 percent.
- Use geotextile fabrics to increase the strength of new roads or roads undergoing reconstruction.
- Encourage the use of alternate, paved routes, if available.
- Restrict use by tracked vehicles and heavy trucks to prevent damage to road surface and base.
- Apply chemical dust suppressants using the admix method, blending the product with the top few inches of surface material. Suppressants may also be applied as surface treatments.
- Pave unpaved permanent roads and other trafficked areas.
- Use vacuum street sweepers.
- Remove mud and other dirt promptly so it does not dry and then turn into dust.
- Limit dust-causing work on windy days.
- Contact your local Air Pollution Control Authority for guidance and training on other dust control measures. Compliance with the local Air Pollution Control Authority constitutes compliance with this BMP.

Maintenance Standards

Respray area as necessary to keep dust to a minimum.

BMP C150: Materials On Hand

Purpose

Quantities of erosion prevention and sediment control materials can be kept on the project site at all times to be used for emergency situations such as unexpected heavy summer rains. Having these materials on-site reduces the time needed to implement BMPs when inspections indicate that existing BMPs are not meeting the Construction SWPPP requirements. In addition, contractors can save money by buying some materials in bulk and storing them at their office or yard.

Conditions of Use

- Construction projects of any size or type can benefit from having materials on hand. A small commercial development project could have a roll of plastic and some gravel available for immediate protection of bare soil and temporary berm construction. A large earthwork project, such as highway construction, might have several tons of straw, several rolls of plastic, flexible pipe, sandbags, geotextile fabric and steel "T" posts.
- Materials are stockpiled and readily available before any site clearing, grubbing, or earthwork begins. A large contractor or developer could keep a stockpile of materials that are available to be used on several projects.
- If storage space at the project site is at a premium, the contractor could maintain the materials at their office or yard. The office or yard must be less than an hour from the project site.

Design and Installation Specifications

Depending on project type, size, complexity, and length, materials and quantities will vary. A good minimum that will cover numerous situations includes:

Material	Measure	Quantity
Clear Plastic, 6 mil	100 foot roll	1-2
Drainpipe, 6 or 8 inch diameter	25 foot section	4-6
Sandbags, filled	each	25-50
Straw Bales for mulching,	approx. 50# each	10-20
Quarry Spalls	ton	2-4
Washed Gravel	cubic yard	2-4
Geotextile Fabric	100 foot roll	1-2
Catch Basin Inserts	each	2-4
Steel "T" Posts	each	12-24

Maintenance Standards

- All materials with the exception of the quarry spalls, steel "T" posts, and gravel should be kept covered and out of both sun and rain.
- Re-stock materials used as needed.

BMP C153: Material Delivery, Storage and Containment

Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in a designated area, and installing secondary containment.

Conditions of Use

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Petroleum products such as fuel, oil and grease
- Soil stabilizers and binders (e.g. Polyacrylamide)
- Fertilizers, pesticides and herbicides
- Detergents
- Asphalt and concrete compounds
- Hazardous chemicals such as acids, lime, adhesives, paints, solvents and curing compounds
- Any other material that may be detrimental if released to the environment

Design and Installation Specifications

The following steps should be taken to minimize risk:

- Temporary storage area should be located away from vehicular traffic, near the construction entrance(s), and away from waterways or storm drains.
- Material Safety Data Sheets (MSDS) should be supplied for all materials stored. Chemicals should be kept in their original labeled containers.
- Hazardous material storage on-site should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- During the wet weather season (Oct 1 – April 30), consider storing materials in a covered area.
- Materials should be stored in secondary containments, such as earthen dike, horse trough, or even a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, in secondary containment.

- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids to reduce corrosion. Domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.

Material Storage Areas and Secondary Containment Practices:

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 shall be stored in approved containers and drums and shall not be overfilled. Containers and drums shall be stored in temporary secondary containment facilities.
- Temporary secondary containment facilities shall provide for a spill containment volume able to contain precipitation from a 25 year, 24 hour storm event, plus 10% of the total enclosed container volume of all containers, or 110% of the capacity of the largest container within its boundary, whichever is greater.
- Secondary containment facilities shall be impervious to the materials stored therein for a minimum contact time of 72 hours.
- Secondary containment facilities shall be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills shall be collected and placed into drums. These liquids shall be handled as hazardous waste unless testing determines them to be non-hazardous.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- During the wet weather season (Oct 1 – April 30), each secondary containment facility shall be covered during non-working days, prior to and during rain events.
- Keep material storage areas clean, organized and equipped with an ample supply of appropriate spill clean-up material (spill kit).
- The spill kit should include, at a minimum:
    - 1-Water Resistant Nylon Bag
    - 3-Oil Absorbent Socks 3"x 4'
    - 2-Oil Absorbent Socks 3"x 10'
    - 12-Oil Absorbent Pads 17"x19"
    - 1-Pair Splash Resistant Goggles
    - 3-Pair Nitrile Gloves
    - 10-Disposable Bags with Ties
    - Instructions

BMP C162: Scheduling

Purpose

Sequencing a construction project reduces the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.

Conditions of Use

The construction sequence schedule is an orderly listing of all major land-disturbing activities together with the necessary erosion and sedimentation control measures planned for the project. This type of schedule guides the contractor on work to be done before other work is started so that serious erosion and sedimentation problems can be avoided.

Following a specified work schedule that coordinates the timing of land-disturbing activities and the installation of control measures is perhaps the most cost-effective way of controlling erosion during construction. The removal of surface ground cover leaves a site vulnerable to accelerated erosion. Construction procedures that limit land clearing, provide timely installation of erosion and sedimentation controls, and restore protective cover quickly can significantly reduce the erosion potential of a site.

Design Considerations

- Avoid rainy periods.
- Schedule projects to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding in order to revegetate cut and fill slopes as the work progresses.

4.2 Runoff Conveyance and Treatment BMPs

BMP C200: Interceptor Dike and Swale

Purpose

Provide a ridge of compacted soil, or a ridge with an upslope swale, at the top or base of a disturbed slope or along the perimeter of a disturbed construction area to convey stormwater. Use the dike and/or swale to intercept the runoff from unprotected areas and direct it to areas where erosion can be controlled. This can prevent storm runoff from entering the work area or sediment-laden runoff from leaving the construction site.

Conditions of Use

Where the runoff from an exposed site or disturbed slope must be conveyed to an erosion control facility which can safely convey the stormwater.

- Locate upslope of a construction site to prevent runoff from entering disturbed area.
- When placed horizontally across a disturbed slope, it reduces the amount and velocity of runoff flowing down the slope.
- Locate downslope to collect runoff from a disturbed area and direct it to a sediment basin.

Design and Installation Specifications

- Dike and/or swale and channel must be stabilized with temporary or permanent vegetation or other channel protection during construction.
- Channel requires a positive grade for drainage; steeper grades require channel protection and check dams.
- Review construction for areas where overtopping may occur.
- Can be used at top of new fill before vegetation is established.
- May be used as a permanent diversion channel to carry the runoff.
- Sub-basin tributary area should be one acre or less.
- Design capacity for the peak flow from a 10-year, 24-hour storm, assuming a Type 1A rainfall distribution, for temporary facilities. Alternatively, use 1.6 times the 10-year, 1-hour flow indicated by an approved continuous runoff model. For facilities that will also serve on a permanent basis, consult the local government's drainage requirements.

Interceptor dikes shall meet the following criteria:

Top Width	2 feet minimum.
Height	1.5 feet minimum on berm.
Side Slope	2:1 or flatter.
Grade	Depends on topography, however, dike system minimum is 0.5%, maximum is 1%.
Compaction	Minimum of 90 percent ASTM D698 standard proctor.

Horizontal Spacing of Interceptor Dikes:

Average Slope	Slope Percent	Flowpath Length
20H:1V or less	3-5%	300 feet
(10 to 20)H:1V	5-10%	200 feet
(4 to 10)H:1V	10-25%	100 feet
(2 to 4)H:1V	25-50%	50 feet

Stabilization depends on velocity and reach

Slopes <5% Seed and mulch applied within 5 days of dike construction (*see BMP C121, Mulching*).

Slopes 5 - 40% Dependent on runoff velocities and dike materials. Stabilization should be done immediately using either sod or riprap or other measures to avoid erosion.

- The upslope side of the dike shall provide positive drainage to the dike outlet. No erosion shall occur at the outlet. Provide energy dissipation measures as necessary. Sediment-laden runoff must be released through a sediment trapping facility.
- Minimize construction traffic over temporary dikes. Use temporary cross culverts for channel crossing.

Interceptor swales shall meet the following criteria:

Bottom Width	2 feet minimum; the bottom shall be level.
Depth	1-foot minimum.
Side Slope	2:1 or flatter.
Grade	Maximum 5 percent, with positive drainage to a suitable outlet (such as a sediment pond).
Stabilization	Seed as per *BMP C120, Temporary and Permanent Seeding*, or *BMP C202, Channel Lining*, 12 inches thick of riprap pressed into the bank and extending at least 8 inches vertical from the bottom.

- Inspect diversion dikes and interceptor swales once a week and after every rainfall. Immediately remove sediment from the flow area.
- Damage caused by construction traffic or other activity must be repaired before the end of each working day.

Check outlets and make timely repairs as needed to avoid gully formation. When the area below the temporary diversion dike is permanently stabilized, remove the dike and fill and stabilize the channel to blend with the natural surface.

BMP C207: Check Dams

Purpose

Construction of small dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

Conditions of Use

Where temporary channels or permanent channels are not yet vegetated, channel lining is infeasible, and velocity checks are required.

- Check dams may not be placed in streams unless approved by the State Department of Fish and Wildlife. Check dams may not be placed in wetlands without approval from a permitting agency.
- Check dams shall not be placed below the expected backwater from any salmonid bearing water between October 1 and May 31 to ensure that there is no loss of high flow refuge habitat for overwintering juvenile salmonids and emergent salmonid fry.

Design and Installation Specifications

Whatever material is used, the dam should form a triangle when viewed from the side. This prevents undercutting as water flows over the face of the dam rather than falling directly onto the ditch bottom.

Check dams in association with sumps work more effectively at slowing flow and retaining sediment than just a check dam alone. A deep sump should be provided immediately upstream of the check dam.

- In some cases, if carefully located and designed, check dams can remain as permanent installations with very minor regrading. They may be left as either spillways, in which case accumulated sediment would be graded and seeded, or as check dams to prevent further sediment from leaving the site.
- Check dams can be constructed of either rock or pea-gravel filled bags. Numerous new products are also available for this purpose. They tend to be re-usable, quick and easy to install, effective, and cost efficient.
- Check dams should be placed perpendicular to the flow of water.
- The maximum spacing between the dams shall be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.
- Keep the maximum height at 2 feet at the center of the dam.
- Keep the center of the check dam at least 12 inches lower than the outer edges at natural ground elevation.
- Keep the side slopes of the check dam at 2:1 or flatter.
- Key the stone into the ditch banks and extend it beyond the abutments a minimum of 18 inches to avoid washouts from overflow around the dam.

- Use filter fabric foundation under a rock or sand bag check dam. If a blanket ditch liner is used, this is not necessary. A piece of organic or synthetic blanket cut to fit will also work for this purpose.
- Rock check dams shall be constructed of appropriately sized rock. The rock must be placed by hand or by mechanical means (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the dam is lower than the edges. The rock used must be large enough to stay in place given the expected design flow through the channel.
- In the case of grass-lined ditches and swales, all check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale - unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.
- Ensure that channel appurtenances, such as culvert entrances below check dams, are not subject to damage or blockage from displaced stones. Figure 4.13 depicts a typical rock check dam.

Maintenance Standards

Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches one half the sump depth.

- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

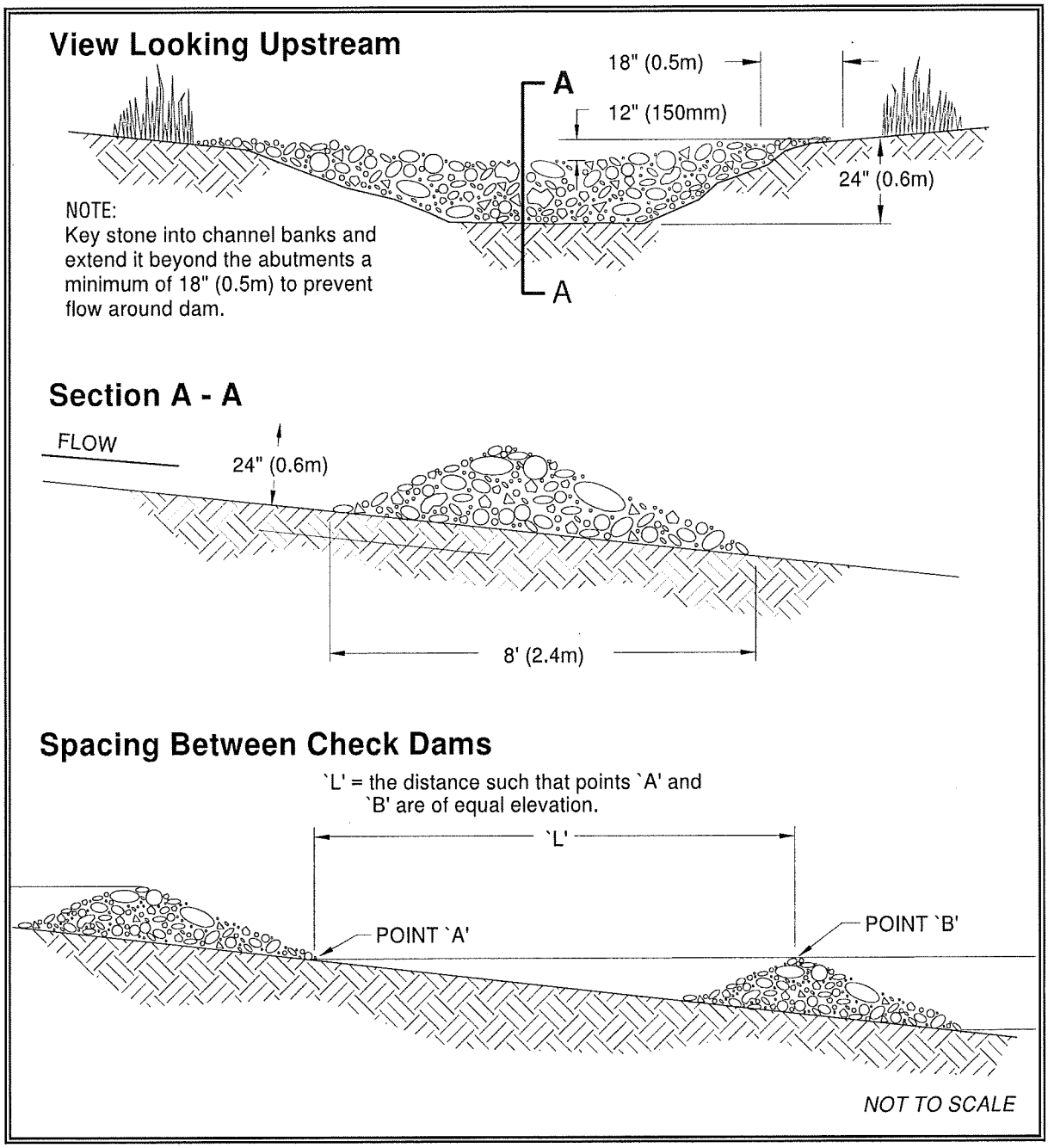


Figure 4.13 – Check Dams

BMP C233: Silt Fence

Purpose

Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. See Figure 4.19 for details on silt fence construction.

Conditions of Use

Silt fence may be used downslope of all disturbed areas.

- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to a sediment pond. The only circumstance in which overland flow can be treated solely by a silt fence, rather than by a sediment pond, is when the area draining to the fence is one acre or less and flow rates are less than 0.5 cfs.
- Silt fences should not be constructed in streams or used in V-shaped ditches. They are not an adequate method of silt control for anything deeper than sheet or overland flow.

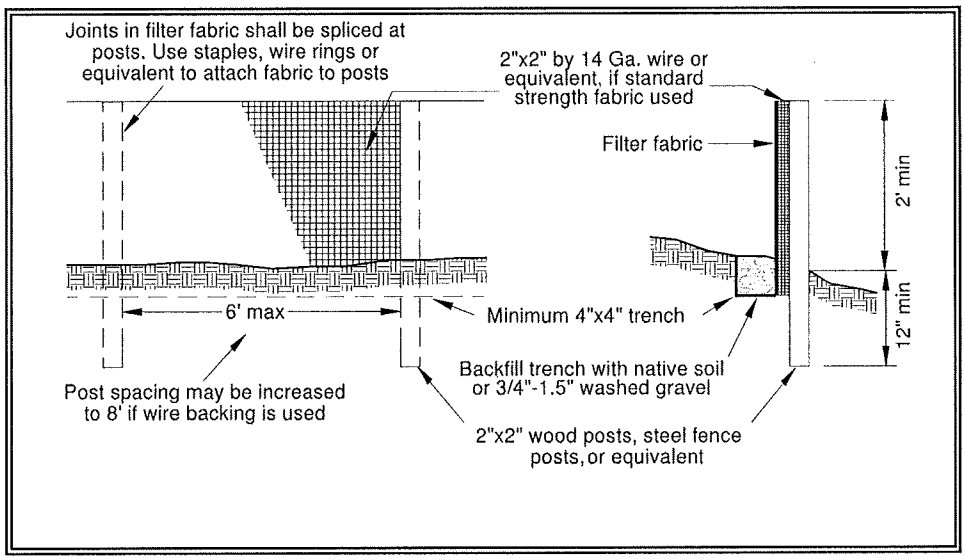


Figure 4.19 – Silt Fence

Design and Installation Specifications

- Drainage area of 1 acre or less or in combination with sediment basin in a larger site.
- Maximum slope steepness (normal (perpendicular) to fence line) 1:1.
- Maximum sheet or overland flow path length to the fence of 100 feet.
- No flows greater than 0.5 cfs.
- The geotextile used shall meet the following standards. All geotextile properties listed below are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in Table 4.10):

Table 4.10 Geotextile Standards	
Polymeric Mesh AOS (ASTM D4751)	0.60 mm maximum for slit film wovens (#30 sieve). 0.30 mm maximum for all other geotextile types (#50 sieve). 0.15 mm minimum for all fabric types (#100 sieve).
Water Permittivity (ASTM D4491)	0.02 sec^{-1} minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. Minimum for extra strength fabric. 100 lbs minimum for standard strength fabric.
Grab Tensile Strength (ASTM D4632)	30% maximum
Ultraviolet Resistance (ASTM D4355)	70% minimum

- Standard strength fabrics shall be supported with wire mesh, chicken wire, 2-inch x 2-inch wire, safety fence, or jute mesh to increase the strength of the fabric. Silt fence materials are available that have synthetic mesh backing attached.
- Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F. to 120°F.
- 100 percent biodegradable silt fence is available that is strong, long lasting, and can be left in place after the project is completed, if permitted by local regulations.
- Standard Notes for construction plans and specifications follow. Refer to Figure 4.19 for standard silt fence details.

  The contractor shall install and maintain temporary silt fences at the locations shown in the Plans. The silt fences shall be constructed in the areas of clearing, grading, or drainage prior to starting those activities. A silt fence shall not be considered temporary if the silt fence must function beyond the life of the contract. The silt fence shall prevent soil carried by runoff water from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.

  The minimum height of the top of silt fence shall be 2 feet and the maximum height shall be 2½ feet above the original ground surface.

  The geotextile shall be sewn together at the point of manufacture, or at an approved location as determined by the Engineer, to form geotextile lengths as required. All sewn seams shall be located at a support post. Alternatively, two sections of silt fence can be overlapped, provided the Contractor can demonstrate, to the satisfaction of the Engineer, that the overlap is long enough and that the adjacent fence sections are close enough together to prevent silt laden water from escaping through the fence at the overlap.

The geotextile shall be attached on the up-slope side of the posts and support system with staples, wire, or in accordance with the manufacturer's recommendations. The geotextile shall be attached to the posts in a manner that reduces the potential for geotextile tearing at the staples, wire, or other connection device. Silt fence back-up support for the geotextile in the form of a wire or plastic mesh is dependent on the properties of the geotextile selected for use. If wire or plastic back-up mesh is used, the mesh shall be fastened securely to the up-slope of the posts with the geotextile being up-slope of the mesh back-up support.

The geotextile at the bottom of the fence shall be buried in a trench to a minimum depth of 4 inches below the ground surface. The trench shall be backfilled and the soil tamped in place over the buried portion of the geotextile, such that no flow can pass beneath the fence and scouring can not occur. When wire or polymeric back-up support mesh is used, the wire or polymeric mesh shall extend into the trench a minimum of 3 inches.

The fence posts shall be placed or driven a minimum of 18 inches. A minimum depth of 12 inches is allowed if topsoil or other soft subgrade soil is not present and a minimum depth of 18 inches cannot be reached. Fence post depths shall be increased by 6 inches if the fence is located on slopes of 3:1 or steeper and the slope is perpendicular to the fence. If required post depths cannot be obtained, the posts shall be adequately secured by bracing or guying to prevent overturning of the fence due to sediment loading.

Silt fences shall be located on contour as much as possible, except at the ends of the fence, where the fence shall be turned uphill such that the silt fence captures the runoff water and prevents water from flowing around the end of the fence.

If the fence must cross contours, with the exception of the ends of the fence, gravel check dams placed perpendicular to the back of the fence shall be used to minimize concentrated flow and erosion along the back of the fence. The gravel check dams shall be approximately 1-foot deep at the back of the fence. It shall be continued perpendicular to the fence at the same elevation until the top of the check dam intercepts the ground surface behind the fence. The gravel check dams shall consist of crushed surfacing base course, gravel backfill for walls, or shoulder ballast. The gravel check dams shall be located every 10 feet along the fence where the fence must cross contours. The slope of the fence line where contours must be crossed shall not be steeper than 3:1.

Wood, steel or equivalent posts shall be used. Wood posts shall have minimum dimensions of 2 inches by 2 inches by 3 feet minimum length, and shall be free of defects such as knots, splits, or gouges.

Steel posts shall consist of either size No. 6 rebar or larger, ASTM A 120 steel pipe with a minimum diameter of 1-inch, U, T, L, or C shape steel posts with a minimum weight of 1.35 lbs./ft. or other steel posts having equivalent strength and bending resistance to the post sizes listed. The spacing of the support posts shall be a maximum of 6 feet.

Fence back-up support, if used, shall consist of steel wire with a maximum mesh spacing of 2 inches, or a prefabricated polymeric mesh. The strength of the wire or polymeric mesh shall be equivalent to or greater than 180 lbs. grab tensile strength. The polymeric mesh must be as resistant to ultraviolet radiation as the geotextile it supports.

- Silt fence installation using the slicing method specification details follow. Refer to Figure 4.20 for slicing method details.

  The base of both end posts must be at least 2 to 4 inches above the top of the silt fence fabric on the middle posts for ditch checks to drain properly. Use a hand level or string level, if necessary, to mark base points before installation.

  Install posts 3 to 4 feet apart in critical retention areas and 6 to 7 feet apart in standard applications.

  Install posts 24 inches deep on the downstream side of the silt fence, and as close as possible to the fabric, enabling posts to support the fabric from upstream water pressure.

  Install posts with the nipples facing away from the silt fence fabric.

  Attach the fabric to each post with three ties, all spaced within the top 8 inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1 inch vertically apart. In addition, each tie should be positioned to hang on a post nipple when tightening to prevent sagging.

  Wrap approximately 6 inches of fabric around the end posts and secure with 3 ties.

  No more than 24 inches of a 36-inch fabric is allowed above ground level.

  The rope lock system must be used in all ditch check applications.

  The installation should be checked and corrected for any deviation before compaction. Use a flat-bladed shovel to tuck fabric deeper into the ground if necessary.

  Compaction is vitally important for effective results. Compact the soil immediately next to the silt fence fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first and then each side twice for a total of four trips.

Maintenance Standards

- Any damage shall be repaired immediately.
- If concentrated flows are evident uphill of the fence, they must be intercepted and conveyed to a sediment pond.
- It is important to check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
- Sediment deposits shall either be removed when the deposit reaches approximately one-third the height of the silt fence, or a second silt fence shall be installed.
- If the filter fabric (geotextile) has deteriorated due to ultraviolet breakdown, it shall be replaced.

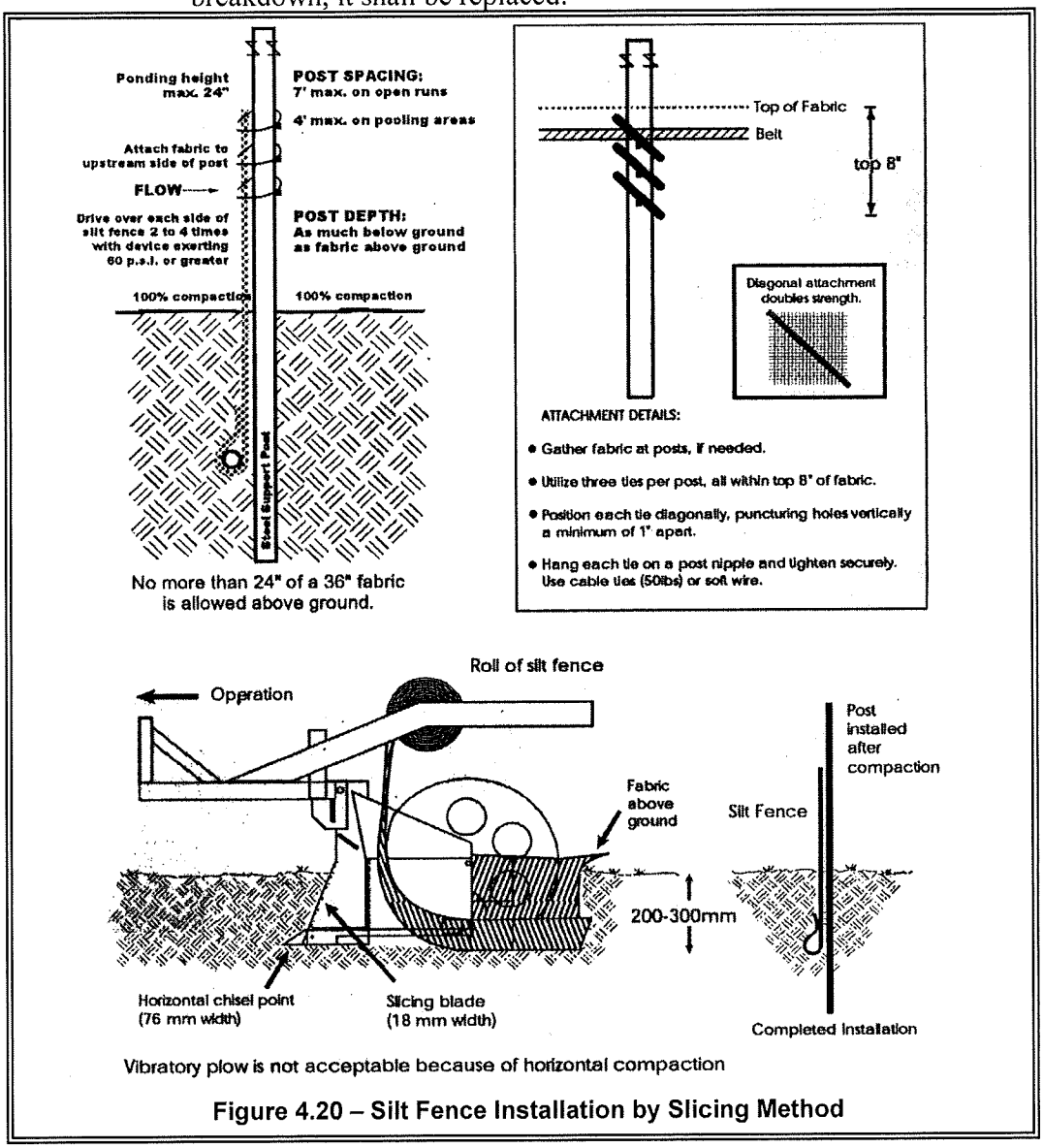


Figure 4.20 – Silt Fence Installation by Slicing Method

BMP C240: Sediment Trap

Purpose

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites cleared and/or graded during construction. Sediment traps, along with other perimeter controls, shall be installed before any land disturbance takes place in the drainage area.

Conditions of Use

Prior to leaving a construction site, stormwater runoff must pass through a sediment pond or trap or other appropriate sediment removal best management practice. Non-engineered sediment traps may be used on-site prior to an engineered sediment trap or sediment pond to provide additional sediment removal capacity.

It is intended for use on sites where the tributary drainage area is less than 3 acres, with no unusual drainage features, and a projected build-out time of six months or less. The sediment trap is a temporary measure (with a design life of approximately 6 months) and shall be maintained until the site area is permanently protected against erosion by vegetation and/or structures.

Sediment traps and ponds are only effective in removing sediment down to about the medium silt size fraction. Runoff with sediment of finer grades (fine silt and clay) will pass through untreated, emphasizing the need to control erosion to the maximum extent first.

Whenever possible, sediment-laden water shall be discharged into onsite, relatively level, vegetated areas (see BMP C234 – Vegetated Strip). This is the only way to effectively remove fine particles from runoff unless chemical treatment or filtration is used. This can be particularly useful after initial treatment in a sediment trap or pond. The areas of release must be evaluated on a site-by-site basis in order to determine appropriate locations for and methods of releasing runoff. Vegetated wetlands shall not be used for this purpose. Frequently, it may be possible to pump water from the collection point at the downhill end of the site to an upslope vegetated area. Pumping shall only augment the treatment system, not replace it, because of the possibility of pump failure or runoff volume in excess of pump capacity.

All projects that are constructing permanent facilities for runoff quantity control should use the rough-graded or final-graded permanent facilities for traps and ponds. This includes combined facilities and infiltration facilities. When permanent facilities are used as temporary sedimentation facilities, the surface area requirement of a sediment trap or pond must be met. If the surface area requirements are larger than the surface area of the permanent facility, then the trap or pond shall be enlarged to comply with the surface area requirement. The permanent pond shall also be divided into two cells as required for sediment ponds.

Either a permanent control structure or the temporary control structure (described in BMP C241, Temporary Sediment Pond) can be used. If a permanent control structure is used, it may be advisable to partially restrict the lower orifice with gravel to increase residence time while still allowing dewatering of the pond. A shut-off valve may be added to the control structure to allow complete retention of stormwater in emergency situations. In this case, an emergency overflow weir must be added.

A skimmer may be used for the sediment trap outlet if approved by the Local Permitting Authority.

Design and Installation Specifications

- See Figures 4.22 and 4.23 for details.
- If permanent runoff control facilities are part of the project, they should be used for sediment retention.
- To determine the sediment trap geometry, first calculate the design surface area (*SA*) of the trap, measured at the invert of the weir. Use the following equation:

  $SA = FS(Q_2/V_S)$

  where

  Q_2 = Design inflow based on the peak discharge from the developed 2-year runoff event from the contributing drainage area as computed in the hydrologic analysis. The 10-year peak flow shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection. If no hydrologic analysis is required, the Rational Method may be used.

  V_S = The settling velocity of the soil particle of interest. The 0.02 mm (medium silt) particle with an assumed density of 2.65 g/cm^3 has been selected as the particle of interest and has a settling velocity (V_S) of 0.00096 ft/sec.

  FS = A safety factor of 2 to account for non-ideal settling.

  Therefore, the equation for computing surface area becomes:

  $SA = 2 \times Q_2/0.00096$ or

  2080 square feet per cfs of inflow

  Note: Even if permanent facilities are used, they must still have a surface area that is at least as large as that derived from the above formula. If they do not, the pond must be enlarged.
- To aid in determining sediment depth, all sediment traps shall have a staff gauge with a prominent mark 1-foot above the bottom of the trap.

- Sediment traps may not be feasible on utility projects due to the limited work space or the short-term nature of the work. Portable tanks may be used in place of sediment traps for utility projects.

Maintenance Standards

- Sediment shall be removed from the trap when it reaches 1-foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

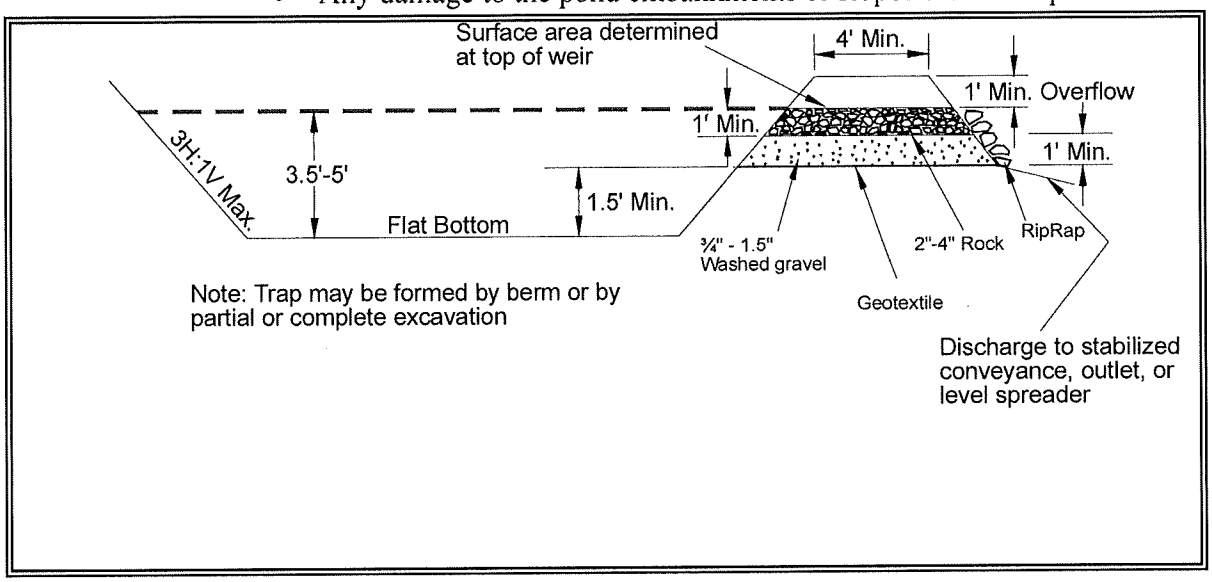


Figure 4.22 Cross Section of Sediment Trap

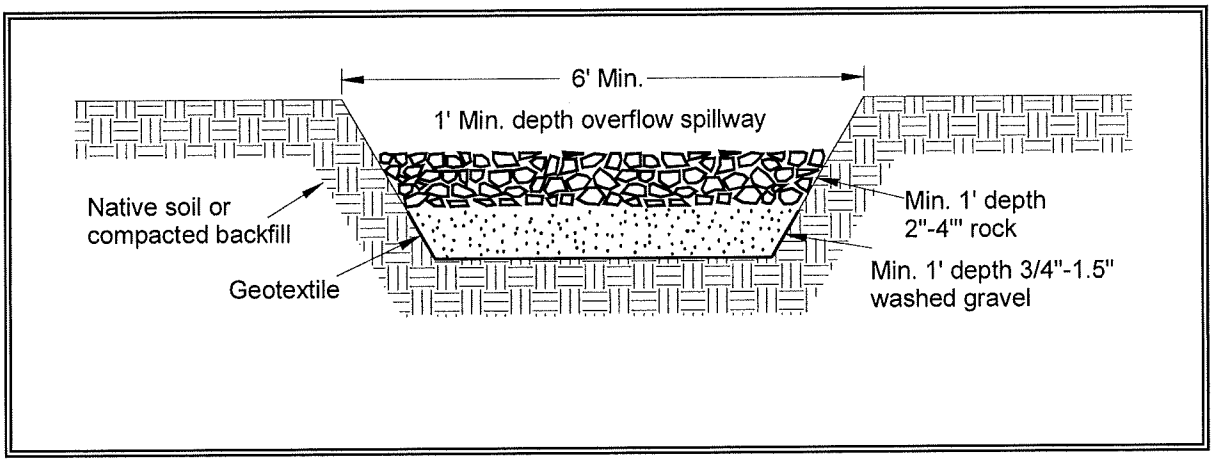


Figure 4.23 Sediment Trap Outlet

BMP C250: Construction Stormwater Chemical Treatment

Purpose

This BMP applies when using stormwater chemicals in batch treatment or flow-through treatment.

Turbidity is difficult to control once fine particles are suspended in stormwater runoff from a construction site. Sedimentation ponds are effective at removing larger particulate matter by gravity settling, but are ineffective at removing smaller particulates such as clay and fine silt. Traditional erosion and sediment control BMPs may not be adequate to ensure compliance with the water quality standards for turbidity in receiving water.

Chemical treatment can reliably provide exceptional reductions of turbidity and associated pollutants. Chemical treatment may be required to meet turbidity stormwater discharge requirements, especially when construction is to proceed through the wet season.

Conditions of Use

Formal written approval from Ecology is required for the use of chemical treatment regardless of site size. The Local Permitting Authority may also require review and approval. When approved, the chemical treatment system must be included in the Stormwater Pollution Prevention Plan (SWPPP).

Design and Installation Specifications

See Appendix II-B for background information on chemical treatment.

Criteria for Chemical Treatment Product Use: Chemically treated stormwater discharged from construction sites must be nontoxic to aquatic organisms. The Chemical Technology Assessment Protocol (CTAPE) must be used to evaluate chemicals proposed for stormwater treatment. Only chemicals approved by Ecology under the CTAPE may be used for stormwater treatment. The approved chemicals, their allowable application techniques (batch treatment or flow-through treatment), allowable application rates, and conditions of use can be found at the Department of Ecology Emerging Technologies website: http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html

Treatment System Design Considerations: The design and operation of a chemical treatment system should take into consideration the factors that determine optimum, cost-effective performance. It is important to recognize the following:

- Only Ecology approved chemicals may be used and must follow approved dose rates.
- The pH of the stormwater must be in the proper range for the polymers to be effective, which is typically 6.5 to 8.5.
- The coagulant must be mixed rapidly into the water to ensure proper dispersion.

- A flocculation step is important to increase the rate of settling, to produce the lowest turbidity, and to keep the dosage rate as low as possible.
- Too little energy input into the water during the flocculation phase results in flocs that are too small and/or insufficiently dense. Too much energy can rapidly destroy floc as it is formed.
- Care must be taken in the design of the withdrawal system to minimize outflow velocities and to prevent floc discharge. Discharge from a batch treatment system should be directed through a physical filter such as a vegetated swale that would catch any unintended floc discharge. Currently, flow-through systems always discharge through the chemically enhanced sand filtration system.
- System discharge rates must take into account downstream conveyance integrity.

Polymer Batch Treatment Process Description:

A batch chemical treatment system consists of the stormwater collection system (either temporary diversion or the permanent site drainage system), an untreated stormwater storage pond, pumps, a chemical feed system, treatment cells, and interconnecting piping.

The batch treatment system shall use a minimum of two lined treatment cells in addition to the untreated stormwater storage pond. Multiple treatment cells allow for clarification of treated water while other cells are being filled or emptied. Treatment cells may be ponds or tanks. Ponds with constructed earthen embankments greater than six feet high require special engineering analyses.

Stormwater is collected at interception point(s) on the site and is diverted by gravity or by pumping to an untreated stormwater storage pond or other untreated stormwater holding area. The stormwater is stored until treatment occurs. It is important that the holding pond be large enough to provide adequate storage.

The first step in the treatment sequence is to check the pH of the stormwater in the untreated stormwater storage pond. The pH is adjusted by the application of carbon dioxide or a base until the stormwater in the storage pond is within the desired pH range, 6.5 to 8.5. When used, carbon dioxide is added immediately downstream of the transfer pump. Typically sodium bicarbonate (baking soda) is used as a base, although other bases may be used. When needed, base is added directly to the untreated stormwater storage pond. The stormwater is recirculated with the treatment pump to provide mixing in the storage pond. Initial pH

adjustments should be based on daily bench tests. Further pH adjustments can be made at any point in the process.

Once the stormwater is within the desired pH range (dependant on polymer being used), the stormwater is pumped from the untreated stormwater storage pond to a treatment cell as polymer is added. The polymer is added upstream of the pump to facilitate rapid mixing.

After polymer addition, the water is kept in a lined treatment cell for clarification of the sediment-floc. In a batch mode process, clarification typically takes from 30 minutes to several hours. Prior to discharge samples are withdrawn for analysis of pH and turbidity. If both are acceptable, the treated water is discharged.

Several configurations have been developed to withdraw treated water from the treatment cell. The original configuration is a device that withdraws the treated water from just beneath the water surface using a float with adjustable struts that prevent the float from settling on the cell bottom. This reduces the possibility of picking up sediment-floc from the bottom of the pond. The struts are usually set at a minimum clearance of about 12 inches; that is, the float will come within 12 inches of the bottom of the cell. Other systems have used vertical guides or cables which constrain the float, allowing it to drift up and down with the water level. More recent designs have an H-shaped array of pipes, set on the horizontal.

This scheme provides for withdrawal from four points rather than one. This configuration reduces the likelihood of sucking settled solids from the bottom. It also reduces the tendency for a vortex to form. Inlet diffusers, a long floating or fixed pipe with many small holes in it, are also an option.

Safety is a primary concern. Design should consider the hazards associated with operations, such as sampling. Facilities should be designed to reduce slip hazards and drowning. Tanks and ponds should have life rings, ladders, or steps extending from the bottom to the top.

Polymer Flow-Through Treatment Process Description:

At a minimum, a flow-through chemical treatment system consists of the stormwater collection system (either temporary diversion or the permanent site drainage system), an untreated stormwater storage pond, and the chemically enhanced sand filtration system.

Stormwater is collected at interception point(s) on the site and is diverted by gravity or by pumping to an untreated stormwater storage pond or other untreated stormwater holding area. The stormwater is stored until

treatment occurs. It is important that the holding pond be large enough to provide adequate storage.

Stormwater is then pumped from the untreated stormwater storage pond to the chemically enhanced sand filtration system where polymer is added. Adjustments to pH may be necessary before chemical addition. The sand filtration system continually monitors the stormwater for turbidity and pH. If the discharge water is ever out of an acceptable range for turbidity or pH, the water is recycled to the untreated stormwater pond where it can be retreated.

For batch treatment and flow-through treatment, the following equipment should be located in a lockable shed:

- the chemical injector;
- secondary non-corrosive containment for acid, caustic, buffering compound, and treatment chemical;
- emergency shower and eyewash, and
- monitoring equipment.

System Sizing

Certain sites are required to implement flow control for the developed sites. These sites must also control stormwater release rates during construction. Generally, these are sites that discharge stormwater directly, or indirectly, through a conveyance system, into a fresh water. System sizing is dependent on flow control requirements.

Sizing Criteria for Batch Treatment Systems for Flow Control Exempt Water Bodies:

The total volume of the untreated stormwater storage pond and treatment ponds or tanks must be large enough to treat the volume of stormwater that is produced during multiple day storm events. It is recommended that at a minimum the untreated stormwater storage pond be sized to hold 1.5 times the runoff volume of the 10-year, 24-hour storm event. Bypass should be provided around the chemical treatment system to accommodate extreme storm events. Runoff volume shall be calculated using the methods presented in Volume 3, Chapter 2. Worst-case land cover conditions (i.e., producing the most runoff) should be used for analyses (in most cases, this would be the land cover conditions just prior to final landscaping).

Primary settling should be encouraged in the untreated stormwater storage pond. A forebay with access for maintenance may be beneficial.

There are two opposing considerations in sizing the treatment cells. A larger cell is able to treat a larger volume of water each time a batch is processed. However, the larger the cell the longer the time required to empty the cell. A larger cell may also be less effective at flocculation and therefore require a longer settling time. The simplest approach to sizing the treatment cell is to multiply the allowable discharge flow rate times the desired drawdown time. A 4-hour drawdown time allows one batch per cell per 8-hour work period, given 1 hour of flocculation followed by two hours of settling.

If the discharge is directly to a lake, flow control exempt receiving water listed in Appendix E of Volume I, or to an infiltration system, there is no discharge flow limit.

Ponds sized for flow control water bodies must at a minimum meet the sizing criteria for flow control exempt waters.

Sizing Criteria for Flow-Through Treatment Systems for Flow Control Exempt Water Bodies:

When sizing storage ponds or tanks for flow-through systems for flow control exempt water bodies, the treatment system capacity should be a factor. The untreated stormwater storage pond or tank should be sized to hold 1.5 times the runoff volume of the 10-year, 24-hour storm event minus the treatment system flowrate for an 8-hour period. For a chitosan-enhanced sand filtration system, the treatment system flowrate should be sized using a hydraulic loading rate between 6-8 gpm/ft^2. Other hydraulic loading rates may be more appropriate for other systems. Bypass should be provided around the chemical treatment system to accommodate extreme storms. Runoff volume shall be calculated using the methods presented in Volume 3, Chapter 2. Worst-case land cover conditions (i.e., producing the most runoff) should be used for analyses (in most cases, this would be the land cover conditions just prior to final landscaping).

Sizing Criteria for Flow Control Water Bodies:

Sites that must implement flow control for the developed site condition must also control stormwater release rates during construction. Construction site stormwater discharges shall not exceed the discharge durations of the pre-developed condition for the range of pre-developed discharge rates from ½ of the 2-year flow through the 10-year flow as predicted by an approved continuous runoff model. The pre-developed condition to be matched shall be the land cover condition immediately prior to the development project. This restriction on release rates can affect the size of the storage pond and treatment cells.

The following is how WWHM can be used to determine the release rates from the chemical treatment systems:

1. Determine the pre-developed flow durations to be matched by entering the land use area under the "Pre-developed" scenario in WWHM. The default flow range is from ½ of the 2-year flow through the 10-year flow.
2. Enter the post developed land use area in the "Developed Unmitigated" scenario in WWHM.
3. Copy the land use information from the "Developed Unmitigated" to "Developed Mitigated" scenario.
4. While in the "Developed Mitigated" scenario, add a pond element under the basin element containing the post-developed land use areas. This pond element represents information on the available untreated stormwater storage and discharge from the chemical treatment system. In cases where the discharge from the chemical treatment system is controlled by a pump, a stage/storage/discharge (SSD) table representing the pond must be generated outside WWHM and imported into WWHM. WWHM can route the runoff from the post-developed condition through this SSD table (the pond) and determine compliance with the flow duration standard. This would be an iterative design procedure where if the initial SSD table proved to be inadequate, the designer would have to modify the SSD table outside WWHM and re-import in WWHM and route the runoff through it again. The iteration will continue until a pond that complies with the flow duration standard is correctly sized.

Notes on SSD table characteristics:

- The pump discharge rate would likely be initially set at just below ½ of the 2-year flow from the pre-developed condition. As runoff coming into the untreated stormwater storage pond increases and the available untreated stormwater storage volume gets used up, it would be necessary to increase the pump discharge rate above ½ of the 2-year. The increase(s) above ½ of the 2-year must be such that they provide some relief to the untreated stormwater storage needs but at the same time will not cause violations of the flow duration standard at the higher flows. The final design SSD table will identify the appropriate pumping rates and the corresponding stage and storages.
- When building such a flow control system, the design must ensure that any automatic adjustments to the pumping rates will be as a result of changes to the available storage in accordance with the final design SSD table.

5. It should be noted that the above procedures would be used to meet the flow control requirements. The chemical treatment system

must be able to meet the runoff treatment requirements. It is likely that the discharge flow rate of ½ of the 2-year or more may exceed the treatment capacity of the system. If that is the case, the untreated stormwater discharge rate(s) (i.e., influent to the treatment system) must be reduced to allow proper treatment. Any reduction in the flows would likely result in the need for a larger untreated stormwater storage volume.

- If the discharge is to a municipal storm drainage system, the allowable discharge rate may be limited by the capacity of the public system. It may be necessary to clean the municipal storm drainage system prior to the start of the discharge to prevent scouring solids from the drainage system. If the municipal storm drainage system discharges to a water body not on the flow control exempt list, the project site is subject to flow control requirements.

If system design does not allow you to discharge at the slower rates as described above and if the site has a retention or detention pond that will serve the planned development, the discharge from the treatment system may be directed to the permanent retention/detention pond to comply with the flow control requirement. In this case, the untreated stormwater storage pond and treatment system will be sized according to the sizing criteria for flow-through treatment systems for flow control exempt water bodies described earlier except all discharge (water passing through the treatment system and stormwater bypassing the treatment system) will be directed into the permanent retention/detention pond. If site constraints make locating the untreated stormwater storage pond difficult, the permanent retention/detention pond may be divided to serve as the untreated stormwater storage pond and the post-treatment flow control pond. A berm or barrier must be used in this case so the untreated water does not mix with the treated water. Both untreated stormwater storage requirements, and adequate post-treatment flow control must be achieved. The post-treatment flow control pond's revised dimensions must be entered into the WWHM and the WWHM must be run to confirm compliance with the flow control requirement.

Maintenance Standards

Monitoring: At a minimum, the following monitoring shall be conducted. Test results shall be recorded on a daily log kept on site. Additional testing may be required by the NPDES permit based on site conditions

Operational Monitoring

- Total volume treated and discharged
- Flow must be continuously monitored and recorded at not greater than 15-minute intervals

- Type and amount of chemical used for pH adjustment, if any
- Quantity of chemical used for treatment
- Settling time

Compliance Monitoring

- Influent and effluent pH and turbidity must be continuously monitored and recorded at not greater than 15-minute intervals.
- pH and turbidity of the receiving water

Biomonitoring

Treated stormwater must be non-toxic to aquatic organisms. Treated stormwater must be tested for aquatic toxicity or residual chemical content. Frequency of biomonitoring will be determined by Ecology.

Residual chemical tests must be approved by Ecology prior to their use.

If testing treated stormwater for aquatic toxicity, you must test for acute (lethal) toxicity. Bioassays shall be conducted by a laboratory accredited by Ecology, unless otherwise approved by Ecology. Acute toxicity tests shall be conducted per the CTAPE protocol.

Discharge Compliance: Prior to discharge, treated stormwater must be sampled and tested for compliance with pH and turbidity limits. These limits may be established by the Construction Stormwater General Permit or a site-specific discharge permit. Sampling and testing for other pollutants may also be necessary at some sites. pH must be within the range of 6.5 to 8.5 standard units and not cause a change in the pH of the receiving water of more than 0.2 standard units.

Treated stormwater samples and measurements shall be taken from the discharge pipe or another location representative of the nature of the treated stormwater discharge. Samples used for determining compliance with the water quality standards in the receiving water shall not be taken from the treatment pond prior to decanting. Compliance with the water quality standards is determined in the receiving water.

Operator Training: Each contractor who intends to use chemical treatment shall be trained by an experienced contractor on an active site.

Standard BMPs: Surface stabilization BMPs should be implemented on site to prevent significant erosion. All sites shall use a truck wheel wash to prevent tracking of sediment off site.

Sediment Removal and Disposal:

- Sediment shall be removed from the storage or treatment cells as necessary. Typically, sediment removal is required at least once during a wet season and at the decommissioning of the cells. Sediment remaining in the cells between batches may enhance the settling process and reduce the required chemical dosage.
- Sediment that is known to be non-toxic may be incorporated into the site away from drainages.

BMP C251: Construction Stormwater Filtration

Purpose

Filtration removes sediment from runoff originating from disturbed areas of the site.

Conditions of Use

Traditional BMPs used to control soil erosion and sediment loss from sites under development may not be adequate to ensure compliance with the water quality standard for turbidity in the receiving water. Filtration may be used in conjunction with gravity settling to remove sediment as small as fine silt (0.5 µm). The reduction in turbidity will be dependent on the particle size distribution of the sediment in the stormwater. In some circumstances, sedimentation and filtration may achieve compliance with the water quality standard for turbidity.

The use of construction stormwater filtration does not require approval from Ecology as long as treatment chemicals are not used. Filtration in conjunction with polymer treatment requires testing under the Chemical Technology Assessment Protocol – Ecology (CTAPE) before it can be initiated. Approval from the appropriate regional Ecology office must be obtained at each site where polymers use is proposed prior to use. For more guidance on stormwater chemical treatment see BMP C250.

Background Information

Filtration with sand media has been used for over a century to treat water and wastewater. The use of sand filtration for treatment of stormwater has developed recently, generally to treat runoff from streets, parking lots, and residential areas. The application of filtration to construction stormwater is currently under development.

Design and Installation Specifications

Two types of filtration systems may be applied to construction stormwater treatment: rapid and slow. Rapid sand filters are the typical system used for water and wastewater treatment. They can achieve relatively high hydraulic flow rates, on the order of 2 to 20 gpm/sf, because they have automatic backwash systems to remove accumulated solids. In contrast, slow sand filters have very low hydraulic rates, on the order of 0.02 gpm/sf, because they do not have backwash systems. To date, slow sand filtration has generally been used to treat stormwater. Slow sand filtration is mechanically simple in comparison to rapid sand filtration but requires a much larger filter area.

Filtration Equipment. Sand media filters are available with automatic backwashing features that can filter to 50 µm particle size. Screen or bag filters can filter down to 5 µm. Fiber wound filters can remove particles down to 0.5 µm. Filters should be sequenced from the largest to the smallest pore opening. Sediment removal efficiency will be related to particle size distribution in the stormwater.

Treatment Process Description. Stormwater is collected at interception point(s) on the site and is diverted to an untreated stormwater sediment pond or tank for removal of large sediment and storage of the stormwater before it is treated by the filtration system. The untreated stormwater is pumped from the trap, pond, or tank through the filtration system in a rapid sand filtration system. Slow sand filtration systems are designed as flow through systems using gravity.

Maintenance Standards

Rapid sand filters typically have automatic backwash systems that are triggered by a pre-set pressure drop across the filter. If the backwash water volume is not large or substantially more turbid than the untreated stormwater stored in the holding pond or tank, backwash return to the untreated stormwater pond or tank may be appropriate. However, other means of treatment and disposal may be necessary.

- Screen, bag, and fiber filters must be cleaned and/or replaced when they become clogged.
- Sediment shall be removed from the storage and/or treatment ponds as necessary. Typically, sediment removal is required once or twice during a wet season and at the decommissioning of the ponds.

Sizing Criteria for Flow-Through Treatment Systems for Flow Control Exempt Water Bodies:

When sizing storage ponds or tanks for flow-through systems for flow control exempt water bodies the treatment system capacity should be a factor. The untreated stormwater storage pond or tank should be sized to hold 1.5 times the runoff volume of the 10-year, 24-hour storm event minus the treatment system flowrate for an 8-hour period. For a chitosan-enhanced sand filtration system, the treatment system flowrate should be sized using a hydraulic loading rate between 6-8 gpm/ft^2. Other hydraulic loading rates may be more appropriate for other systems. Bypass should be provided around the chemical treatment system to accommodate extreme storms. Runoff volume shall be calculated using the methods presented in Volume 3, Chapter 2. Worst-case conditions (i.e., producing the most runoff) should be used for analyses (most likely conditions present prior to final landscaping).

Sizing Criteria for Flow Control Water Bodies:

Sites that must implement flow control for the developed site condition must also control stormwater release rates during construction. Construction site stormwater discharges shall not exceed the discharge durations of the pre-developed condition for the range of pre-developed discharge rates from 1/2 of the 2-year flow through the 10-year flow as

predicted by an approved continuous runoff model. The pre-developed condition to be matched shall be the land cover condition immediately prior to the development project. This restriction on release rates can affect the size of the storage pond, the filtration system, and the flow rate through the filter system.

The following is how WWHM can be used to determine the release rates from the filtration systems:

1. Determine the pre-developed flow durations to be matched by entering the land use area under the "Pre-developed" scenario in WWHM. The default flow range is from ½ of the 2-year flow through the 10-year flow.
2. Enter the post developed land use area in the "Developed Unmitigated" scenario in WWHM.
3. Copy the land use information from the "Developed Unmitigated" to "Developed Mitigated" scenario.
4. There are two possible ways to model stormwater filtration systems:

   4a. The stormwater filtration system uses an untreated stormwater storage pond/tank and the discharge from this pond/tank is pumped to one or more filters. In-line filtration chemicals would be added to the flow right after the pond/tank and before the filter(s). Because the discharge is pumped, WWHM can't generate a stage/storage /discharge (SSD) table for this system. This system is modeled the same way as described in BMP C250 and is as follows:

   While in the "Developed Mitigated" scenario, add a pond element under the basin element containing the post-developed land use areas. This pond element represents information on the available untreated stormwater storage and discharge from the filtration system. In cases where the discharge from the filtration system is controlled by a pump, a stage/storage/discharge (SSD) table representing the pond must be generated outside WWHM and imported into WWHM. WWHM can route the runoff from the post-developed condition through this SSD table (the pond) and determine compliance with the flow duration standard. This would be an iterative design procedure where if the initial SSD table proved to be out of compliance, the designer would have to modify the SSD table outside WWHM and re-import in WWHM and route the runoff through it again. The iteration will continue until a pond that enables compliance with the flow duration standard is designed.

Notes on SSD table characteristics:

- The pump discharge rate would likely be initially set at just below ½ if the 2-year flow from the pre-developed condition. As runoff coming into the untreated stormwater storage pond increases and the available untreated stormwater storage volume gets used up, it would be necessary to increase the pump discharge rate above ½ of the 2-year. The increase(s) above ½ of the 2-year must be such that they provide some relief to the untreated stormwater storage needs but at the same time they will not cause violations of the flow duration standard at the higher flows. The final design SSD table will identify the appropriate pumping rates and the corresponding stage and storages.
- When building such a flow control system, the design must ensure that any automatic adjustments to the pumping rates will be as a result of changes to the available storage in accordance with the final design SSD table.

4b. The stormwater filtration system uses a storage pond/tank and the discharge from this pond/tank gravity flows to the filter. This is usually a slow sand filter system and it is possible to model it in WWHM as a Filter element or as a combination of Pond and Filter element placed in series. The stage/storage/discharge table(s) may then be generated within WWHM as follows:

(i) While in the "Developed Mitigated" scenario, add a Filter element under the basin element containing the post-developed land use areas. The length and width of this filter element would have to be the same as the bottom length and width of the upstream untreated stormwater storage pond/tank.

(ii) In cases where the length and width of the filter is not the same as those for the bottom of the upstream untreated stormwater storage tank/pond, the treatment system may be modeled as a Pond element followed by a Filter element. By having these two elements, WWHM would then generate a SSD table for the storage pond which then gravity flows to the Filter element. The Filter element downstream of the untreated stormwater storage pond would have a storage component through the media, and an overflow component for when the filtration capacity is exceeded.

WWHM can route the runoff from the post-developed condition through the treatment systems in 4b and determine compliance with the flow duration standard. This would be an iterative design procedure where if the initial sizing estimates for the treatment system proved to be inadequate, the designer would have to

modify the system and route the runoff through it again. The iteration would continue until compliance with the flow duration standard is achieved.

5. It should be noted that the above procedures would be used to meet the flow control requirements. The filtration system must be able to meet the runoff treatment requirements. It is likely that the discharge flow rate of ½ of the 2-year or more may exceed the treatment capacity of the system. If that is the case, the untreated stormwater discharge rate(s) (i.e., influent to the treatment system) must be reduced to allow proper treatment. Any reduction in the flows would likely result in the need for a larger untreated stormwater storage volume.

If system design does not allow you to discharge at the slower rates as described above and if the site has a retention or detention pond that will serve the planned development, the discharge from the treatment system may be directed to the permanent retention/detention pond to comply with the flow control requirements. In this case, the untreated stormwater storage pond and treatment system will be sized according to the sizing criteria for flow-through treatment systems for flow control exempt waterbodies described earlier except all discharges (water passing through the treatment system and stormwater bypassing the treatment system) will be directed into the permanent retention/detention pond. If site constraints make locating the untreated stormwater storage pond difficult, the permanent retention/detention pond may be divided to serve as the untreated stormwater discharge pond and the post-treatment flow control pond. A berm or barrier must be used in this case so the untreated water does not mix with the treated water. Both untreated stormwater storage requirements, and adequate post-treatment flow control must be achieved. The post-treatment flow control pond's revised dimensions must be entered into the WWHM and the WWHM must be run to confirm compliance with the flow control requirement.

Appendix II-B
Background Information on Chemical Treatment

Coagulation and flocculation have been used for over a century to treat water. It is used less frequently for the treatment of wastewater. The use of coagulation and flocculation for treating stormwater is a very recent application. Experience with the treatment of water and wastewater has resulted in a basic understanding of the process, in particular factors that affect performance. This experience can provide insights as to how to most effectively design and operate similar systems in the treatment of stormwater.

Fine particles suspended in water give it a milky appearance, measured as turbidity. Their small size, often much less than 1 μm in diameter, give them a very large surface area relative to their volume. These fine particles typically carry a negative surface charge. Largely because of these two factors, small size and negative charge, these particles tend to stay in suspension for extended periods of time. Thus, removal is not practical by gravity settling. These are called stable suspensions. Polymers, as well as inorganic chemicals such as alum, speed the process of clarification. The added chemical destabilizes the suspension and causes the smaller particles to agglomerate. The process consists of three steps: coagulation, flocculation, and settling or clarification. Each step is explained below as well as the factors that affect the efficiency of the process.

Coagulation: Coagulation is the first step. It is the process by which negative charges on the fine particles that prevent their agglomeration are disrupted. Chemical addition is one method of destabilizing the suspension, and polymers are one class of chemicals that are generally effective. Chemicals that are used for this purpose are called coagulants. Coagulation is complete when the suspension is destabilized by the neutralization of the negative charges. Coagulants perform best when they are thoroughly and evenly dispersed under relatively intense mixing. This rapid mixing involves adding the coagulant in a manner that promotes rapid dispersion, followed by a short time period for destabilization of the particle suspension. The particles are still very small and are not readily separated by clarification until flocculation occurs.

Flocculation: Flocculation is the process by which fine particles that have been destabilized bind together to form larger particles that settle rapidly. Flocculation begins naturally following coagulation, but is enhanced by gentle mixing of the destabilized suspension. Gentle mixing helps to bring particles in contact with one another such that they bind and continually grow to form "flocs." As the size of the flocs increases they become heavier and tend to settle more rapidly.

Clarification: The final step is the settling of the particles. Particle density, size and shape are important during settling. Dense, compact flocs settle more readily than less dense, fluffy flocs. Because of this, flocculation to form dense, compact flocs is particularly important during water treatment. Water temperature is important during settling. Both the density and viscosity of water are affected by temperature; these in turn

affect settling. Cold temperatures increase viscosity and density, thus slowing down the rate at which the particles settle.

The conditions under which clarification is achieved can affect performance. Currents can affect settling. Currents can be produced by wind, by differences between the temperature of the incoming water and the water in the clarifier, and by flow conditions near the inlets and outlets. Quiescent water such as that which occurs during batch clarification provides a good environment for effective performance as many of these factors become less important in comparison to typical sedimentation basins. One source of currents that is likely important in batch systems is movement of the water leaving the clarifier unit. Given that flocs are relatively small and light the exit velocity of the water must be as low as possible. Sediment on the bottom of the basin can be resuspended and removed by fairly modest velocities.

Coagulants: Polymers are large organic molecules that are made up of subunits linked together in a chain-like structure. Attached to these chain-like structures are other groups that carry positive or negative charges, or have no charge. Polymers that carry groups with positive charges are called cationic, those with negative charges are called anionic, and those with no charge (neutral) are called nonionic.

Cationic polymers can be used as coagulants to destabilize negatively charged turbidity particles present in natural waters, wastewater and stormwater. Aluminum sulfate (alum) can also be used as this chemical becomes positively charged when dispersed in water. In practice, the only way to determine whether a polymer is effective for a specific application is to perform preliminary or on-site testing.

Polymers are available as powders, concentrated liquids, and emulsions (which appear as milky liquids). The latter are petroleum based, which are not allowed for construction stormwater treatment. Polymer effectiveness can degrade with time and also from other influences. Thus, manufacturers' recommendations for storage should be followed. Manufacturer's recommendations usually do not provide assurance of water quality protection or safety to aquatic organisms. Consideration of water quality protection is necessary in the selection and use of all polymers.

Application Considerations: Application of coagulants at the appropriate concentration or dosage rate for optimum turbidity removal is important for management of chemical cost, for effective performance, and to avoid aquatic toxicity. The optimum dose in a given application depends on several site-specific features. Turbidity of untreated water can be important with turbidities greater than 5,000 NTU. The surface charge of particles to be removed is also important. Environmental factors that can influence dosage rate are water temperature, pH, and the presence of constituents that consume or otherwise affect polymer effectiveness. Laboratory experiments indicate that mixing previously settled sediment (floc sludge) with the untreated stormwater significantly improves clarification, therefore reducing the effective dosage rate. Preparation of working solutions and thorough dispersal of polymers in water to be treated is also important to establish the appropriate dosage rate.

For a given water sample, there is generally an optimum dosage rate that yields the lowest residual turbidity after settling. When dosage rates below this optimum value (underdosing) are applied, there is an insufficient quantity of coagulant to react with, and therefore destabilize, all of the turbidity present. The result is residual turbidity (after flocculation and settling) that is higher than with the optimum dose. Overdosing, application of dosage rates greater than the optimum value, can also negatively impact performance. Again, the result is higher residual turbidity than that with the optimum dose.

Mixing in Coagulation/Flocculation: The G-value, or just "G," is often used as a measure of the mixing intensity applied during coagulation and flocculation. The symbol G stands for "velocity gradient", which is related in part to the degree of turbulence generated during mixing. High G-values mean high turbulence, and vice versa. High G-values provide the best conditions for coagulant addition. With high G's, turbulence is high and coagulants are rapidly dispersed to their appropriate concentrations for effective destabilization of particle suspensions.

Low G-values provide the best conditions for flocculation. Here, the goal is to promote formation of dense, compact flocs that will settle readily. Low G's provide low turbulence to promote particle collisions so that flocs can form. Low G's generate sufficient turbulence such that collisions are effective in floc formation, but do not break up flocs that have already formed.

Design engineers wishing to review more detailed presentations on this subject are referred to the following textbooks.

- Fair, G., J. Geyer and D. Okun, Water and Wastewater Engineering, Wiley and Sons, NY, 1968.
- American Water Works Association, Water Quality and Treatment, McGraw-Hill, NY, 1990.
- Weber, W.J., Physiochemical Processes for Water Quality Control, Wiley and Sons, NY, 1972.

Adjustment of the pH and Alkalinity: The pH must be in the proper range for the polymers to be effective, which is 6.5 to 8.5 for Calgon CatFloc 2953, the most commonly used polymer. As polymers tend to lower the pH, it is important that the stormwater have sufficient buffering capacity. Buffering capacity is a function of alkalinity. Without sufficient alkalinity, the application of the polymer may lower the pH to below 6.5. A pH below 6.5 not only reduces the effectiveness of the polymer, it may create a toxic condition for aquatic organisms. Stormwater may not be discharged without readjustment of the pH to above 6.5. The target pH should be within 0.2 standard units of the receiving water pH.

Experience gained at several projects in the City of Redmond has shown that the alkalinity needs to be at least 50 mg/L to prevent a drop in pH to below 6.5 when the polymer is added.

BMP C160: Certified Erosion and Sediment Control Lead

Purpose

The project proponent designates at least one person as the responsible representative in charge of erosion and sediment control (ESC), and water quality protection. The designated person shall be the Certified Erosion and Sediment Control Lead (CESCL) who is responsible for ensuring compliance with all local, state, and federal erosion and sediment control and water quality requirements.

Conditions of Use

A CESCL shall be made available on projects one acre or larger that discharge stormwater to surface waters of the state

- The CESCL shall:
  - Have a current certificate proving attendance in an erosion and sediment control training course that meets the minimum ESC training and certification requirements established by Ecology (see details below).

    Ecology will maintain a list of ESC training and certification providers at: www.ecy.wa.gov/programs/wq/stormwater.

  OR

  - Be a Certified Professional in Erosion and Sediment Control (CPESC); for additional information go to: www.cpesc.net

Specifications

- Certification shall remain valid for three years.
- The CESCL shall have authority to act on behalf of the contractor or developer and shall be available, on call, 24 hours per day throughout the period of construction.
- The Construction SWPPP shall include the name, telephone number, fax number, and address of the designated CESCL.
- A CESCL may provide inspection and compliance services for multiple construction projects in the same geographic region.

Duties and responsibilities of the CESCL shall include, but are not limited to the following:

- Maintaining permit file on site at all times which includes the SWPPP and any associated permits and plans.
- Directing BMP installation, inspection, maintenance, modification, and removal.
- Updating all project drawings and the Construction SWPPP with changes made.

- Keeping daily logs, and inspection reports. Inspection reports should include:
  - Inspection date/time.
  - Weather information; general conditions during inspection and approximate amount of precipitation since the last inspection.
  - A summary or list of all BMPs implemented, including observations of all erosion/sediment control structures or practices. The following shall be noted:

    1) Locations of BMPs inspected,

    2) Locations of BMPs that need maintenance,

    3) Locations of BMPs that failed to operate as designed or intended, and

    4) Locations of where additional or different BMPs are required.
  - Visual monitoring results, including a description of discharged stormwater. The presence of suspended sediment, turbid water, discoloration, and oil sheen shall be noted, as applicable.
  - Any water quality monitoring performed during inspection.
  - General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.
- Facilitate, participate in, and take corrective actions resulting from inspections performed by outside agencies or the owner.



APPENDIX C
Additional Alternative BMPs

BMP C106: Wheel Wash

Purpose

Wheel washes reduce the amount of sediment transported onto paved roads by motor vehicles.

Conditions of Use

When a stabilized construction entrance (see BMP C105) is not preventing sediment from being tracked onto pavement.

- Wheel washing is generally an effective BMP when installed with careful attention to topography. For example, a wheel wash can be detrimental if installed at the top of a slope abutting a right-of-way where the water from the dripping truck can run unimpeded into the street.
- Pressure washing combined with an adequately sized and surfaced pad with direct drainage to a large 10-foot x 10-foot sump can be very effective.

Design and Installation Specifications

Suggested details are shown in Figure 4.3. The Local Permitting Authority may allow other designs. A minimum of 6 inches of asphalt treated base (ATB) over crushed base material or 8 inches over a good subgrade is recommended to pave the wheel wash.

Use a low clearance truck to test the wheel wash before paving. Either a belly dump or lowboy will work well to test clearance.

Keep the water level from 12 to 14 inches deep to avoid damage to truck hubs and filling the truck tongues with water.

Midpoint spray nozzles are only needed in extremely muddy conditions.

Wheel wash systems should be designed with a small grade change, 6 to 12 inches for a 10-foot-wide pond, to allow sediment to flow to the low side of pond to help prevent re-suspension of sediment. A drainpipe with a 2- to 3-foot riser should be installed on the low side of the pond to allow for easy cleaning and refilling. Polymers may be used to promote coagulation and flocculation in a closed-loop system. Polyacrylamide (PAM) added to the wheel wash water at a rate of 0.25 - 0.5 pounds per 1,000 gallons of water increases effectiveness and reduces cleanup time. If PAM is already being used for dust or erosion control and is being applied by a water truck, the same truck can be used to change the wash water.

Maintenance Standards

The wheel wash should start out the day with fresh water.

The wash water should be changed a minimum of once per day. On large earthwork jobs where more than 10-20 trucks per hour are expected, the wash water will need to be changed more often.

Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system, such as closed-loop recirculation or land application, or to the sanitary sewer with proper local sewer district approval.

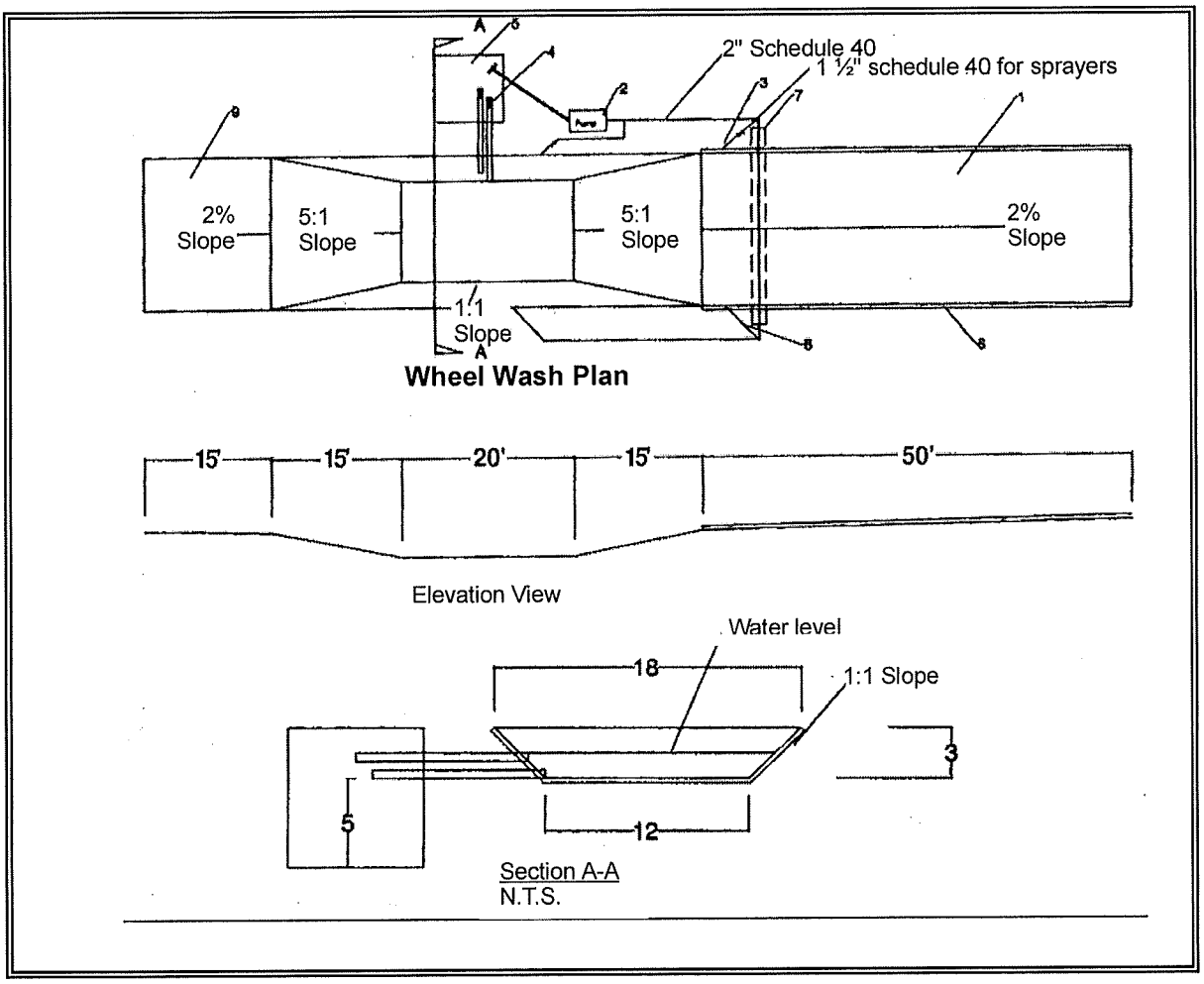


Figure 4.3 Wheel Wash

Notes:

1. Asphalt construction entrance 6 in. asphalt treated base (ATB).
2. 3-inch trash pump with floats on the suction hose.
3. Midpoint spray nozzles, if needed.
4. 6-inch sewer pipe with butterfly valves. Bottom one is a drain. Locate top pipe's invert 1 foot above bottom of wheel wash.
5. 8 foot x 8 foot sump with 5 feet of catch. Build so can be cleaned with trackhoe.
6. Asphalt curb on the low road side to direct water back to pond.
7. 6-inch sleeve under road.
8. Ball valves.
9. 15 foot. ATB apron to protect ground from splashing water.

BMP C122: Nets and Blankets

Purpose

Erosion control nets and blankets are intended to prevent erosion and hold seed and mulch in place on steep slopes and in channels so that vegetation can become well established. In addition, some nets and blankets can be used to permanently reinforce turf to protect drainage ways during high flows. Nets (commonly called matting) are strands of material woven into an open, but high-tensile strength net (for example, coconut fiber matting). Blankets are strands of material that are not tightly woven, but instead form a layer of interlocking fibers, typically held together by a biodegradable or photodegradable netting (for example, excelsior or straw blankets). They generally have lower tensile strength than nets, but cover the ground more completely. Coir (coconut fiber) fabric comes as both nets and blankets.

Conditions of Use

Erosion control nets and blankets should be used:

- To aid permanent vegetated stabilization of slopes 2H:1V or greater and with more than 10 feet of vertical relief.
- For drainage ditches and swales (highly recommended). The application of appropriate netting or blanket to drainage ditches and swales can protect bare soil from channelized runoff while vegetation is established. Nets and blankets also can capture a great deal of sediment due to their open, porous structure. Synthetic nets and blankets can be used to permanently stabilize channels and may provide a cost-effective, environmentally preferable alternative to riprap. 100 percent synthetic blankets manufactured for use in ditches may be easily reused as temporary ditch liners.

Disadvantages of blankets include:

- Surface preparation required;
- On slopes steeper than 2.5:1, blanket installers may need to be roped and harnessed for safety;
- They cost at least $4,000-6,000 per acre installed.

Advantages of blankets include:

- Can be installed without mobilizing special equipment;
- Can be installed by anyone with minimal training;
- Can be installed in stages or phases as the project progresses;
- Seed and fertilizer can be hand-placed by the installers as they progress down the slope;
- Can be installed in any weather;
- There are numerous types of blankets that can be designed with various parameters in mind. Those parameters include: fiber blend, mesh strength, longevity, biodegradability, cost, and availability.

Design and Installation Specifications

- See Figure 4.4 and Figure 4.5 for typical orientation and installation of blankets used in channels and as slope protection. Note: these are typical only; all blankets must be installed per manufacturer's installation instructions.
- Installation is critical to the effectiveness of these products. If good ground contact is not achieved, runoff can concentrate under the product, resulting in significant erosion.
- Installation of Blankets on Slopes:
  1. Complete final grade and track walk up and down the slope.
  2. Install hydromulch with seed and fertilizer.
  3. Dig a small trench, approximately 12 inches wide by 6 inches deep along the top of the slope.
  4. Install the leading edge of the blanket into the small trench and staple approximately every 18 inches. NOTE: Staples are metal,"U"-shaped, and a minimum of 6 inches long. Longer staples are used in sandy soils. Biodegradable stakes are also available.
  5. Roll the blanket slowly down the slope as installer walks backwards. NOTE: The blanket rests against the installer's legs. Staples are installed as the blanket is unrolled. It is critical that the proper staple pattern is used for the blanket being installed. The blanket is not to be allowed to roll down the slope on its own as this stretches the blanket making it impossible to maintain soil contact. In addition, no one is allowed to walk on the blanket after it is in place.
  6. If the blanket is not long enough to cover the entire slope length, the trailing edge of the upper blanket should overlap the leading edge of the lower blanket and be stapled. On steeper slopes, this overlap should be installed in a small trench, stapled, and covered with soil.
- With the variety of products available, it is impossible to cover all the details of appropriate use and installation. Therefore, it is critical that the design engineer consults the manufacturer's information and that a site visit takes place in order to insure that the product specified is appropriate. Information is also available at the following web sites:
  1. WSDOT: http://www.wsdot.wa.gov/eesc/environmental/
  2. Texas Transportation Institute: http://www.dot.state.tx.us/insdtdot/orgchart/cmd/erosion/contents.htm

- Jute matting must be used in conjunction with mulch (BMP C121). Excelsior, woven straw blankets and coir (coconut fiber) blankets may be installed without mulch. There are many other types of erosion control nets and blankets on the market that may be appropriate in certain circumstances.
- In general, most nets (e.g., jute matting) require mulch in order to prevent erosion because they have a fairly open structure. Blankets typically do not require mulch because they usually provide complete protection of the surface.
- Extremely steep, unstable, wet, or rocky slopes are often appropriate candidates for use of synthetic blankets, as are riverbanks, beaches and other high-energy environments. If synthetic blankets are used, the soil should be hydromulched first.
- 100 percent biodegradable blankets are available for use in sensitive areas. These organic blankets are usually held together with a paper or fiber mesh and stitching which may last up to a year.
- Most netting used with blankets is photodegradable, meaning they break down under sunlight (not UV stabilized). However, this process can take months or years even under bright sun. Once vegetation is established, sunlight does not reach the mesh. It is not uncommon to find non-degraded netting still in place several years after installation. This can be a problem if maintenance requires the use of mowers or ditch cleaning equipment. In addition, birds and small animals can become trapped in the netting.

Maintenance Standards

- Good contact with the ground must be maintained, and erosion must not occur beneath the net or blanket.
- Any areas of the net or blanket that are damaged or not in close contact with the ground shall be repaired and stapled.
- If erosion occurs due to poorly controlled drainage, the problem shall be fixed and the eroded area protected.

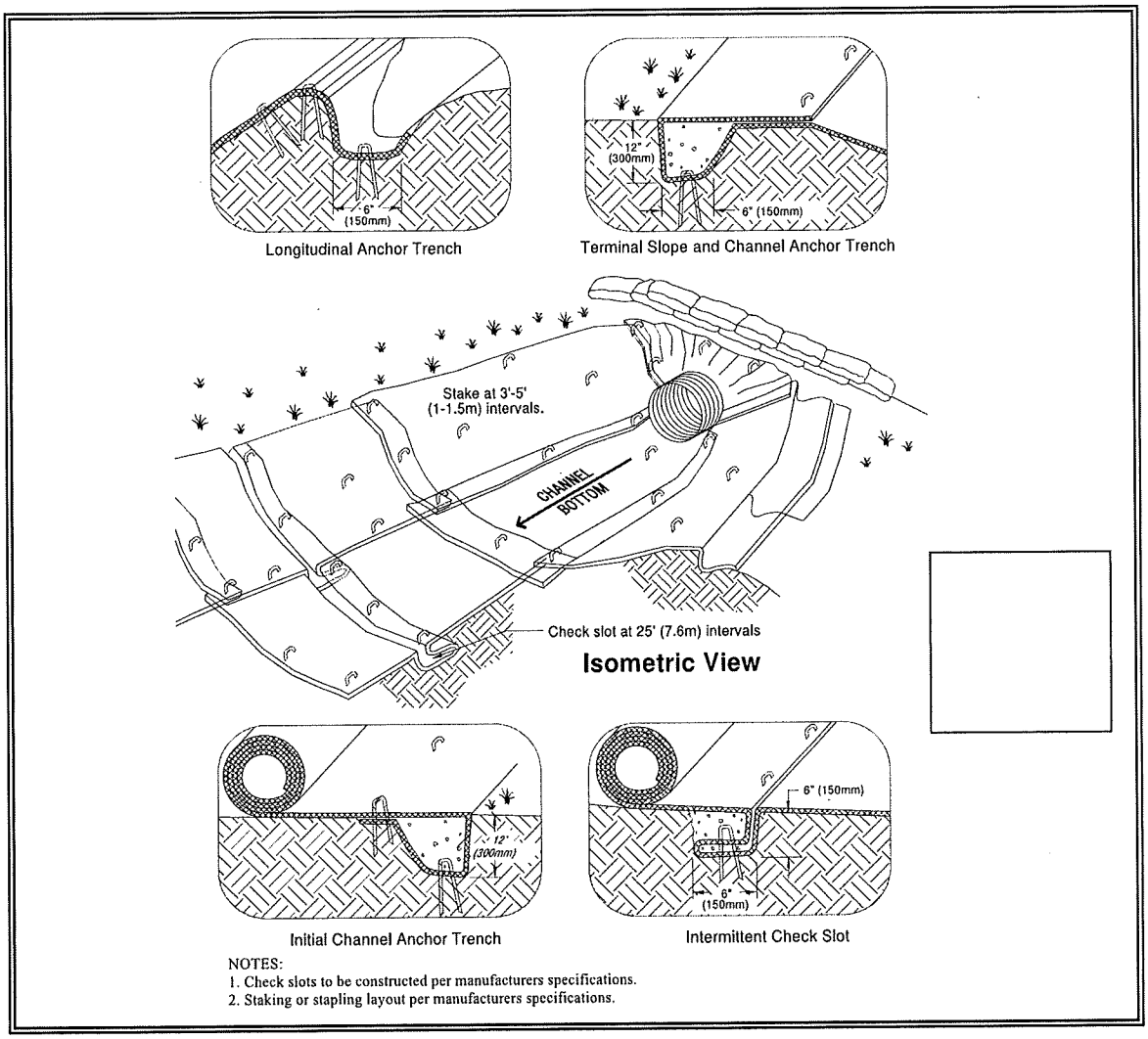


Figure 4.4 – Channel Installation

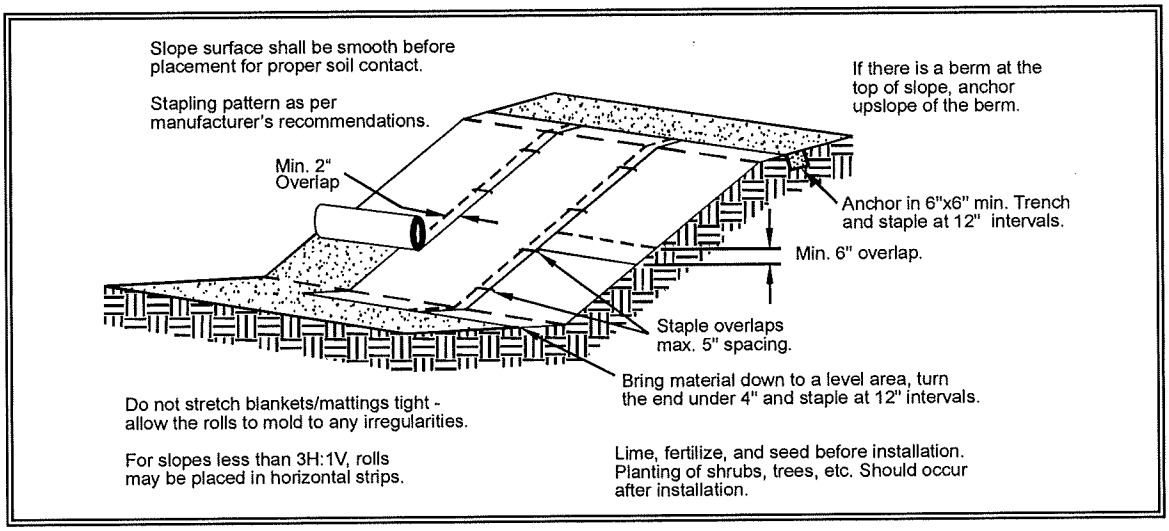


Figure 4.5 – Slope Installation

BMP C208: Triangular Silt Dike (Geotextile-Encased Check Dam)

Purpose

Triangular silt dikes may be used as check dams, for perimeter protection, for temporary soil stockpile protection, for drop inlet protection, or as a temporary interceptor dike.

Conditions of use

May be used in place of straw bales for temporary check dams in ditches of any dimension.

- May be used on soil or pavement with adhesive or staples.
- TSDs have been used to build temporary:

1. sediment ponds;
2. diversion ditches;
3. concrete wash out facilities;
4. curbing;
5. water bars;
6. level spreaders; and,
7. berms.

Design and Installation Specifications

Made of urethane foam sewn into a woven geosynthetic fabric.

It is triangular, 10 inches to 14 inches high in the center, with a 20-inch to 28-inch base. A 2–foot apron extends beyond both sides of the triangle along its standard section of 7 feet. A sleeve at one end allows attachment of additional sections as needed.

- Install with ends curved up to prevent water from flowing around the ends.
- The fabric flaps and check dam units are attached to the ground with wire staples. Wire staples should be No. 11 gauge wire and should be 200 mm to 300 mm in length.
- When multiple units are installed, the sleeve of fabric at the end of the unit shall overlap the abutting unit and be stapled.
- Check dams should be located and installed as soon as construction will allow.
- Check dams should be placed perpendicular to the flow of water.
- When used as check dams, the leading edge must be secured with rocks, sandbags, or a small key slot and staples.
- In the case of grass-lined ditches and swales, check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.

Maintenance Standards

- Triangular silt dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall.

Sediment shall be removed when it reaches one half the height of the dam.

- Anticipate submergence and deposition above the triangular silt dam and erosion from high flows around the edges of the dam. Immediately repair any damage or any undercutting of the dam.

BMP C235: Straw Wattles

Purpose

Straw wattles are temporary erosion and sediment control barriers consisting of straw that is wrapped in biodegradable tubular plastic or similar encasing material. They reduce the velocity and can spread the flow of rill and sheet runoff, and can capture and retain sediment. Straw wattles are typically 8 to 10 inches in diameter and 25 to 30 feet in length. The wattles are placed in shallow trenches and staked along the contour of disturbed or newly constructed slopes. See Figure 4.21 for typical construction details.

Conditions of Use

- Disturbed areas that require immediate erosion protection.
- Exposed soils during the period of short construction delays, or over winter months.
- On slopes requiring stabilization until permanent vegetation can be established.
- Straw wattles are effective for one to two seasons.
- If conditions are appropriate, wattles can be staked to the ground using willow cuttings for added revegetation.
- Rilling can occur beneath wattles if not properly entrenched and water can pass between wattles if not tightly abutted together.

Design Criteria

- It is critical that wattles are installed perpendicular to the flow direction and parallel to the slope contour.
- Narrow trenches should be dug across the slope on contour to a depth of 3 to 5 inches on clay soils and soils with gradual slopes. On loose soils, steep slopes, and areas with high rainfall, the trenches should be dug to a depth of 5 to 7 inches, or 1/2 to 2/3 of the thickness of the wattle.
- Start building trenches and installing wattles from the base of the slope and work up. Excavated material should be spread evenly along the uphill slope and compacted using hand tamping or other methods.
- Construct trenches at contour intervals of 3 to 30 feet apart depending on the steepness of the slope, soil type, and rainfall. The steeper the slope the closer together the trenches.
- Install the wattles snugly into the trenches and abut tightly end to end. Do not overlap the ends.
- Install stakes at each end of the wattle, and at 4-foot centers along entire length of wattle.
- If required, install pilot holes for the stakes using a straight bar to drive holes through the wattle and into the soil.
- At a minimum, wooden stakes should be approximately 3/4 x 3/4 x 24 inches. Willow cuttings or 3/8-inch rebar can also be used for stakes.

Maintenance Standards

- Stakes should be driven through the middle of the wattle, leaving 2 to 3 inches of the stake protruding above the wattle.
- Wattles may require maintenance to ensure they are in contact with soil and thoroughly entrenched, especially after significant rainfall on steep sandy soils.
- Inspect the slope after significant storms and repair any areas where wattles are not tightly abutted or water has scoured beneath the wattles.

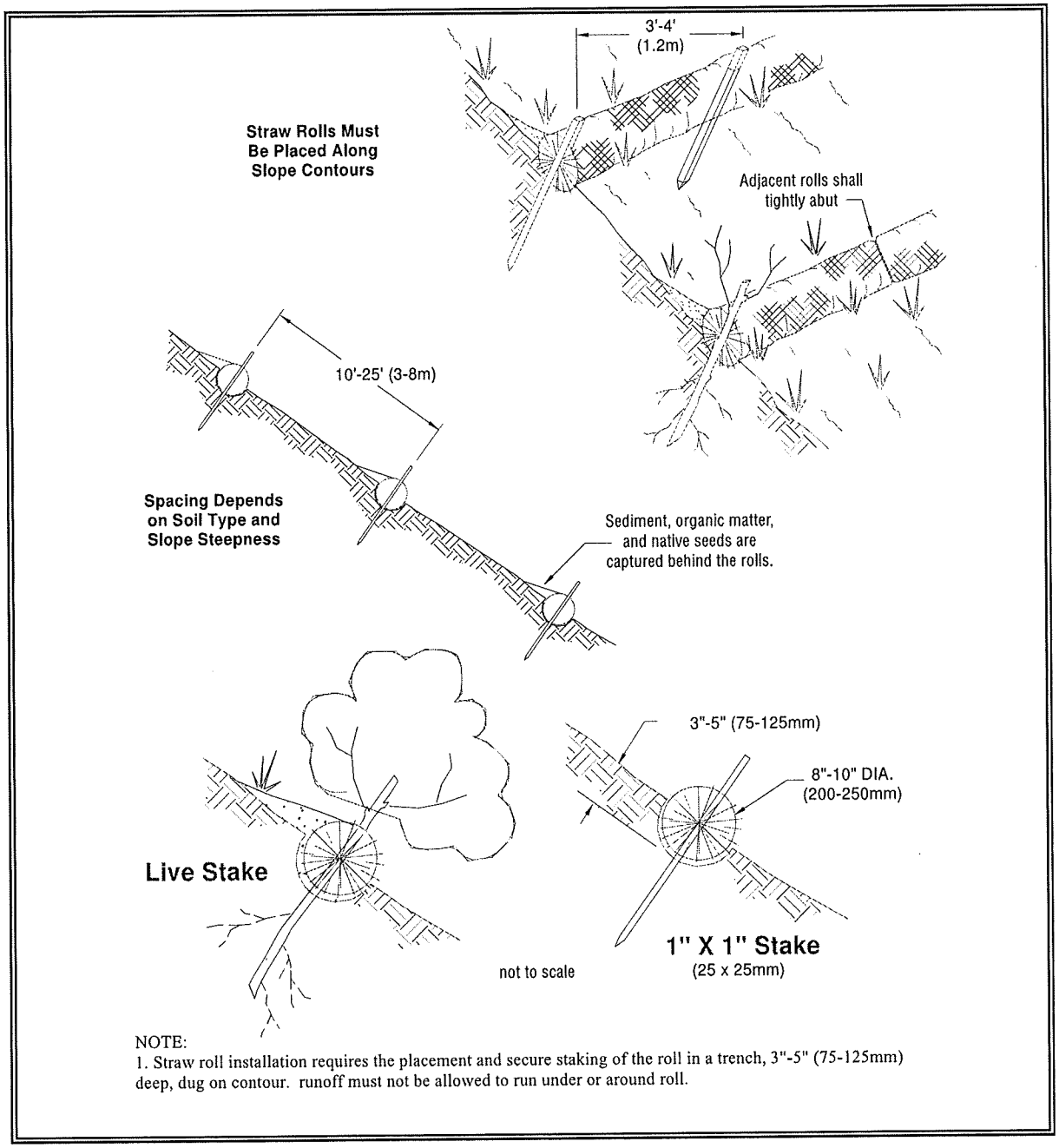


Figure 4.21 – Straw Wattles

APPENDIX D

Notice of Intent to Ecology for Coverage Under NPDES Construction Construction Stormwater General Permit

DEPARTMENT OF ECOLOGY
State of Washington

NOTICE OF INTENT (NOI) APPLICATION FORM

Construction Stormwater General Permit

Check if applicable:
☐ Change or Update Permit Information
☐ Modification of Permit Coverage
Permit #WAR_____

Please print or type all sections of this application. All fields are required unless otherwise marked.

I. Operator/Permittee (Party with operational control over plans and specifications or day-to-day operational control of activities which ensure compliance with Stormwater Pollution Prevention Plan (SWPPP) and permit conditions. Ecology will send correspondence and permit fee invoices to the permittee on record.)

Name: Su Dowie		Company: Foss Waterway Development Authority		
Business Phone: 253-597-8122	Ext.	Unified Business Identifier (UBI): 601-852-198-000 *(UBI is a nine-digit number used to identify a business entity.* ***Write "none" if you do not have a UBI number.)***		
Cell Phone (Optional):	Fax (Optional): 253-597-8129			
E-mail:sdowie@theafoss.com				
Mailing Address: 535 E. Dock Street, #204		City: Tacoma	State: WA	Zip + 4: 98402-4630

II. Property Owner (The party listed on the County Assessor's records as owner and taxpayer of the parcel[s] for which permit coverage is requested. Ecology will not send correspondence and permit fee invoices to the Property Owner. The Property Owner information will be used for emergency contact purposes.)

Name: Su Dowie		Company (if applicable): Foss Waterway Development Authority		
Business Phone: 253-597-8122	Ext.	Unified Business Identifier (UBI): 601-852-198-000 *(UBI is a nine-digit number used to identify a business entity.* ***Write "none" if you do not have a UBI number.)***		
Cell Phone (Optional):	Fax (Optional): 253-597-8129			
E-mail:sdowie@theafoss.com				
Mailing Address: 535 E. Dock Street, #204		City: Tacoma	State: WA	Zip + 4: 98402-4630

III. On-site Contact Person (Typically the Certified Erosion & Sediment Control Lead or Operator/Permittee)

Name: Nick Rohrbach		Company: GeoEngineers, Inc		
Business Phone: 253-732-2138	Ext.	Mailing Address: 1101 S. Fawcett Avenue		
Cell Phone (Optional)	Fax (Optional): 253-383-4923	City: Tacoma	State: WA	Zip + 4: 98402
E-mail:nrohrbach@geoengineers.com				

IV. WebDMR (Electronic Discharge Monitoring Reporting)

You must submit monthly discharge monitoring reports using Ecology's WebDMR system. To sign up for WebDMR, or to register a new site, go to www.ecy.wa.gov/stormwater, and click on the "Construction Stormwater" link. You will find information on WebDMR under the "WebDMR and PARIS" link on the right-hand side. If you are unable to submit your DMRs electronically, you may contact Ecology to request a waiver. Ecology will generally only grant waiver requests to those permittees without internet access. Only a permittee or representative, designated in writing, may request access to or a waiver from WebDMR. To have the ability to use the system immediately, **you must submit the Electronic Signature Agreement with your application**. If you have questions on this process, contact Ecology's WebDMR staff at WebDMR@ecy.wa.gov or 360-407-7097.

V. Site Information

Site or Project Name
American Plating Remediation Project

Street Address or Location Description (*If the site lacks a street address, list its specific location. For example, Intersection of Highway 61 and 34.)*

2110 East D Street

Parcel ID#: _____ *(Optional)*

Type of Construction Activity (*check all that apply*):
- ☐ Residential
- ☐ Commercial
- ☐ Industrial
- ☐ Highway or Road (city ,county, state)
- ☐ Utilities (specify): _____.
- ☒ Other (specify):Remedial Action.

Site Acreage
Total size of your site/project (that you own/control): 1.4 acres.

Total area of soil disturbance (grading and/or excavating) for your site/project over the life of the project: 1.4 acres. *(Note: 1 acre = 43,560 ft².)*

Concrete / Engineered Soils
How many yards of concrete will be poured over the life of the project? 0 yd³ (estimate)

How many yards of recycled concrete will be used over the life of the project? 45 yd³ (estimate)

Will any engineered soils be used? (For example: cement treated base, cement kiln dust, etc.)
☐ Yes ☒ No

City (or nearest city): Tacoma
County: Pierce

Zip Code: 98402

Estimated project start-up date (mm/dd/yy): 02/01/12

Estimated project completion date (mm/dd/yy): 03/01/12

Record the latitude and longitude of the *main entrance* to the site or the approximate center of site.

Latitude: 47° 14' 37" °N Longitude: 122° 25' 51" °W

For assistance with latitude and longitude, refer to any of the following websites: www.getlatlon.com *or* http://www.worldatlas.com/aatlas/imageg.htm. *Please convert all latitude and longitude coordinates into decimal degrees format. For help with this process, go to:* http://www.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html.

VI. Existing Site Conditions

1. Are you aware of contaminated soils present on the site? ☒ Yes ☐ No
2. Are you aware of groundwater contamination located within the site boundary? ☒ Yes ☐ No
3. If you answered yes to questions 1 or 2, will any contaminated soils be disturbed or will any contaminated groundwater be discharged due to the proposed construction activity? ☒ Yes ☐ No

["Contaminated" and "contamination" here mean containing any hazardous substance (as defined in WAC 173-340-200) that does not occur naturally or occurs at greater than natural background levels.]

If you answered yes to Question 3, please explain below or on a separate paper in detail the locations, contaminants, and concentrations, and pollution prevention and/or treatment BMPs proposed to control the discharge of soil/groundwater contaminants. Ecology may request a copy of your SWPPP.

Construction is being performed at the American Plating Site to implement remedial actions specified in the Cleanup Action Plan (CAP) and Consent Decree for the Site. Remedial actions include removal of soil contaminated with metals and capping the 1.4 acre site. Soil with elevated cadmium and chromium concentrations will be excavated from two areas (see attached Figure 4 from the CAP) and disposed of offsite. After completion of soil excavation and removal , 3-feet of clean soil or asphalt (i.e., 16-inches of clean base course and 2-inches of asphalt) will be placed over the entire Site to contain / isolate soils with metals concentrations greater than Model Toxics Control Act (MTCA) Method B criteria for unrestricted landuse (see attached Figure 3 from the CAP for total metals concentrations at the Site). The area over which the soil or asphalt containment will

be placed is shown in attached Figure 1.

No stormwater catchbasins or other stormwater conveyance structures are present on the Site. BMP's for the Site will include a combination of silt fencing, check dams, buffer zones, preserving natural vegetation, mulching, seeding, plastic covering, and dust control. Contaminated soil that is excavated for offsite disposal will also be placed in a lined, bermed, and covered stockpile area(s) prior to transport offsite.

During remedial actions, Site stormwater runoff will be captured, treated, and tested prior to discharge to the sanitary sewer at an authorized discharge location in accordance with applicable regulatory requirements.

Catch basins located offsite, on adjacent parcels and public rights-of-ways, will be protected and monitored during remedial actions at the Site.

Excavation for removal of contaminated soil is estimated to be to a depth of four feet. Groundwater monitoring conducted at the Site indicates that the depth to groundwater ranges from approximately 5 to 9-feet below ground surface. Therefore, it is currently not anticipated that groundwater will not be encountered during remedial excavation (i.e., excavation and backfill to a depth of 4-feet). However, should it be necessary to lower the groundwater level to facilitate excavation and removal of contaminated soil, the extracted groundwater will be captured, treated, and tested prior to discharge to the sanitary sewer in accordance with applicable regulatory requirements.

VII. Stormwater Pollution Prevention Plan (SWPPP)

You must develop a SWPPP prior to starting construction. Do **not** submit your SWPPP with your application. The exception is that Ecology may request a copy of your SWPPP if you answered yes to the questions in Part VI.

VIII. Best Management Practices (BMPs)

You must use the BMPs listed in the Stormwater Management Manual for Western Washington or the Stormwater Management Manual for Eastern Washington or other manuals approved by Ecology. Alternatively, you may use demonstrably equivalent BMPs on the basis of permit condition S9.C.4. If you intend to use a BMP at your site that is not included in these manuals, but that you believe meets the definition of a *demonstrably equivalent* BMP, you must notify the appropriate regional office. (See Definitions in the Construction Stormwater General Permit).*

http://www.ecy.wa.gov/programs/wq/stormwater/construction/contacts.html

**Note that if you receive permit coverage without indicating the preference for a demonstrably equivalent BMP and later decide to use one, you must provide Ecology with notice of the selection of an equivalent BMP no less than 60 days before the intended use of the equivalent BMP.*

IX. Discharge/Receiving Water Information

Indicate whether your site's stormwater and/or dewatering water could enter surface waters, **directly** and/or **indirectly**:

☒ Water will discharge directly or indirectly (through a storm drain system or roadside ditch) into one or more surface waterbodies (wetlands, creeks, lakes, and all other surface waters and water courses).

If your discharge is to a storm sewer system, provide the name of the operator of the storm sewer system:

(e.g., City of Tacoma): City of Tacoma

(NOTE: If your stormwater discharges to a storm sewer system operated by the City of Seattle, King County, Snohomish County, City of Tacoma, Pierce County, or Clark County, you must **also** submit a copy of this NOI to the appropriate jurisdiction.)

☐ Water will discharge to ground with 100% infiltration, with no potential to reach surface waters under any conditions.

If your project includes dewatering, you **must** include dewatering plans and discharge locations in your site Stormwater Pollution Prevention Plan.

Location of Discharge into Surface Waterbody

Enter the waterbody name and latitude/longitude of the point(s) where the site has the potential to discharge into a waterbody (enter all locations).

- Include the names and locations of both direct and indirect discharges to surface waterbodies, even if the risk of discharge is low or limited to periods of extreme weather.
- Some large construction projects (for example, subdivisions, roads, or pipelines) may discharge into several waterbodies.
- If the creek or tributary is unnamed, use a format such as "unnamed tributary to Deschutes River."
- **Attach a separate list if necessary.**

Surface Waterbody Name	Latitude Decimal Degrees	Longitude Decimal Degrees
Thea Foss Waterway	47° 14' 64"° N	122° 25' 27"° W
	° N	° W
	° N	° W
	° N	° W

If your site discharges to a waterbody that is on the impaired waterbodies list (i.e., 303[d] list) for turbidity, fine sediment, high pH, or phosphorus, Ecology will require additional documentation before issuing permit coverage and these sites will be subject to additional sampling and numeric effluent limits (per Permit Condition S8). Ecology will notify you if any additional sampling requirements apply. Information on impaired waterbodies is available online at: http://www.ecy.wa.gov/programs/wq/stormwater/construction/impaired.html.

X. State Environmental Policy Act (SEPA)

This Notice of Intent (NOI) is incomplete and cannot be approved until the applicable SEPA requirements under Chapter 197-11 WAC are met.

Who is the SEPA lead agency on your site? Washington State Department of Ecology.

Has the SEPA lead agency issued a final decision on your checklist? ☐ No ☒ Yes ☐ Exempt*

If No: The NOI is incomplete. Ecology will hold the application until a final SEPA decision is made or the Construction Stormwater NOI public comment period ends, whichever is later. **You must notify Ecology once the lead agency has issued a determination.**

If Yes: Type of SEPA decision issued: ☒ Determination of Non-Significance (DNS) ☐ Mitigated DNS (MDNS) ☐ Determination of Significance (DS) ☐ Final Environmental Impact Statement (EIS) ☐ Other:_____

- Date of final SEPA decision: November 28, 2003.
- If a supplemental EIS, SEPA addendum, or some other type of additional SEPA review was required, please attach and submit with this form.
- Date when all SEPA-related comment & appeal periods are exhausted: January 12, 2004.

***If Exempt:** Attach written documentation, check type of exemption below, and proceed to Section VII.

☐ Watershed Restoration & Fish Habitat Enhancement Exemption (RCW 43.21C.0382).

☐ Infill Development Exemption (RCW 43.21C.229).

☐ Planned Action Exemption (RCW 43.21C.031).

☐ Categorical Exemption. Under what section of the SEPA Rule (WAC 197-11-800) is it exempt? _____ (for example, WAC 197-11-800(1) Minor New Construction)

More SEPA information is available at: http://www.ecy.wa.gov/programs/sea/sepa/e-review.html.

XI. Public Notice

You must publish a public notice at least **once** a week for **two** consecutive weeks with **seven days** between publications, in at least a **single** newspaper of general circulation in the county in which the construction is to take place. Ecology cannot grant permit coverage sooner than the end of the 30-day public comment period, which begins on the date of the **second** public notice.

Mail or fax (360-407-6426) the NOI to Ecology on or **before** the **first** public notice date. If you fax the public notice to Ecology, you must also mail a hard copy. Failure to do so may delay the issuance of your permit.

Provide the **exact** dates (mm/dd/yy) that the first and second public notices will appear in the newspaper(s):

First notice: 10/26/11

Second notice: 11/02/11 (Begins 30-day public comment period.)

For example: First notice: 01/01/10

Second notice: 01/08/10

Name of the newspaper(s) publishing the notices: Tacoma News Tribune

PUBLIC NOTICE TEMPLATE

Complete this template using project-specific information and submit to a local newspaper with general circulation within the county where the project is located. The **bold** language is required by WAC 173-226-130 and must be included in its entirety. (Either use the fill-in template below or **attach on a separate sheet of paper, if necessary.)**

The Foss Waterway Development Authority, 535 E. Dock Street, #204, **is seeking coverage under the Washington State Department of Ecology's Construction Stormwater NPDES and State Waste Discharge General Permit.**

The proposed project, American Plating Remediation Project, **is located at** 2110 East D Street in Tacoma in Pierce County.

This project involves 1.4 **acres of soil disturbance for** remedial action **construction activities.**

During remedial actions, Site stormwater runoff will be captured, treated, and tested prior to discharge to the sanitary sewer at an authorized discharge location in accordance with applicable regulatory requirements.

Any persons desiring to present their views to the Washington State Department of Ecology regarding this application, or interested in Ecology's action on this application, may notify Ecology in writing no later than 30 days of the last date of publication of this notice. Ecology reviews public comments and considers whether discharges from this project would cause a measurable change in receiving water quality, and, if so, whether the project is necessary and in the overriding public interest according to Tier II antidegradation requirements under WAC 173-201A-320.

Comments can be submitted to:
Department of Ecology
Attn: Water Quality Program, Construction Stormwater
P.O. Box 47696, Olympia, WA 98504-7696

XII. Certification of Permittees

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Su Dowle / Foss Waterway Development Authority — Interim Executive Director

Printed Name / Company (operator/permittee only) — Title

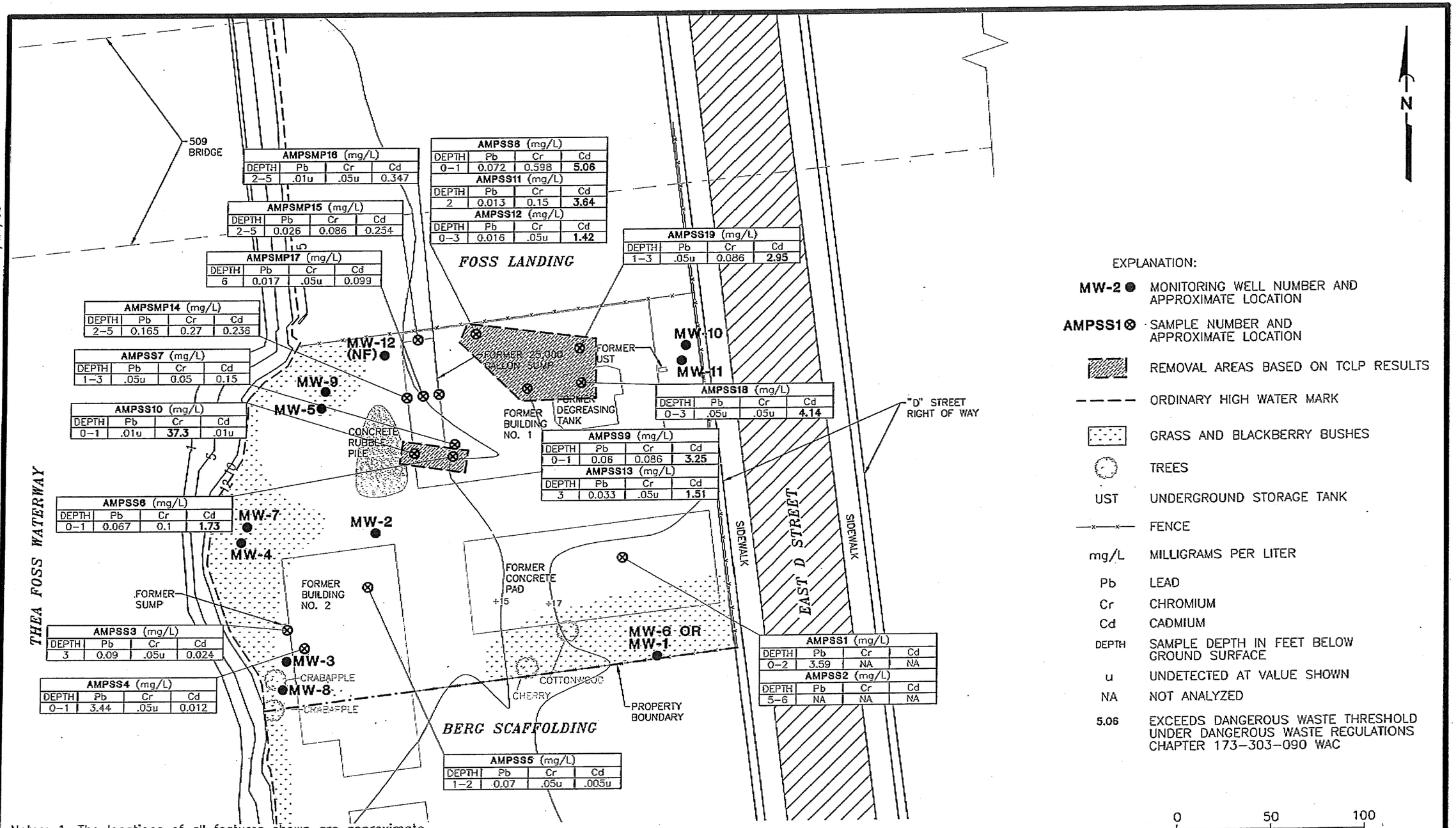
Signature of Operator/Permittee* — Date: 10-21-11

*** Federal regulations require this application is signed by one of the following:**

A. For a corporation: By a principal executive officer of at least the level of vice president.
B. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively.
C. For a municipality, state, federal, or other public facility: By either a principal executive officer or ranking elected official.

Please sign and return this document to the following address:

Washington Department of Ecology - Stormwater
P.O. Box 47696
Olympia, WA 98504-7696



Notes: 1. The locations of all features shown are approximate.
2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.
3. Elevation datum shown is Mean Lower Low Water (MLLW).

Reference: Information and sample locations provided by Marv Coleman, Ecology Personal Communication November 10, 2003.

GeoEngineers

INTERIM ACTION TCLP METALS

FIGURE 4

GRL:TCM:SCY 11/25/03

TACO\10\10751002\00\CAD\1075100200_FIG-2_3_4_5_6.dwg

DRAFT FINAL

11/24/03

GRL:TCM:SCY

TACO\10\10751002\00\CAD\10751002OO_FIG-2_3_4_5_6.dwg

N

509 BRIDGE

AMPSMP16 (mg/kg)			
DEPTH	Pb	Cr	Cd
2–5	103	64.1	66.3

AMPSMP15 (mg/kg)			
DEPTH	Pb	Cr	Cd
2–5	80.4	72.6	24.2

AMPSMP17 (mg/kg)			
DEPTH	Pb	Cr	Cd
6	70.7	**291**	**156**

AMPSMP14 (mg/kg)			
DEPTH	Pb	Cr	Cd
2–5	**317**	**336**	15.3

AMPSS7 (mg/kg)			
DEPTH	Pb	Cr	Cd
1–3	121	154	**118**

AMPSS10 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–1	6.6	**1,570**	0.87

AMPSS6 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–1	**585**	**3,480**	**205**

AMPSS3 (mg/kg)			
DEPTH	Pb	Cr	Cd
3	76.5	**1,360**	2.45

AMPSS4 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–1	**528**	27.9	2.01

AMPSS8 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–1	195	**2,990**	**230**

AMPSS11 (mg/kg)			
DEPTH	Pb	Cr	Cd
2	**497**	**15,500**	**415**

AMPSS12 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–3	33.8	126	**126**

FOSS LANDING

AMPSS19 (mg/kg)			
DEPTH	Pb	Cr	Cd
1–3	22.9	144	**158**

AMPSS18 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–3	68.2	200	**185**

AMPSS9 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–1	154	**1,104**	**225**

AMPSS13 (mg/kg)			
DEPTH	Pb	Cr	Cd
3	71.9	**395**	**395**

AMPSS1 (mg/kg)			
DEPTH	Pb	Cr	Cd
0–2	***13,000***	61.5	3.5

AMPSS2 (mg/kg)			
DEPTH	Pb	Cr	Cd
5–6	9.6	20.7	1.1

AMPSS5 (mg/kg)			
DEPTH	Pb	Cr	Cd
1–2	***2,640***	88.2	2.86

MW-12 (NF)
MW-9
MW-5
MW-7
MW-4
MW-2
MW-3
MW-8
MW-10
MW-11
MW-6 OR MW-1

FORMER 25,000 GALLON SUMP
FORMER UST
FORMER DEGREASING TANK
FORMER BUILDING NO. 1
FORMER SUMP
FORMER BUILDING NO. 2
FORMER CONCRETE PAD
CONCRETE RUBBLE PILE
CRABAPPLE
CRABAPPLE
COTTONWOOD
CHERRY
PROPERTY BOUNDARY
BERG SCAFFOLDING
THEA FOSS WATERWAY
"D" STREET RIGHT OF WAY
EAST D STREET
SIDEWALK
SIDEWALK
+15
+17

EXPLANATION:

- **MW-2** ● MONITORING WELL NUMBER AND APPROXIMATE LOCATION
- **AMPSS1** ⊗ SAMPLE NUMBER AND APPROXIMATE LOCATION
- ORDINARY HIGH WATER MARK
- GRASS AND BLACKBERRY BUSHES
- TREES
- UST UNDERGROUND STORAGE TANK
- FENCE
- mg/kg MILLIGRAMS PER KILOGRAM
- Pb LEAD
- Cr CHROMIUM
- Cd CADMIUM
- DEPTH SAMPLE DEPTH IN FEET BELOW GROUND SURFACE
- **1,360** EXCEEDS MTCA METHOD B CLEANUP LEVEL FOR SOIL, UNLESS OTHERWISE NOTED
- ***2,640*** SAMPLES AMPSS1 AND AMPSS5 EXCEED MTCA METHOD C CLEANUP LEVEL FOR SOIL

0 50 100
APPROXIMATE SCALE IN FEET

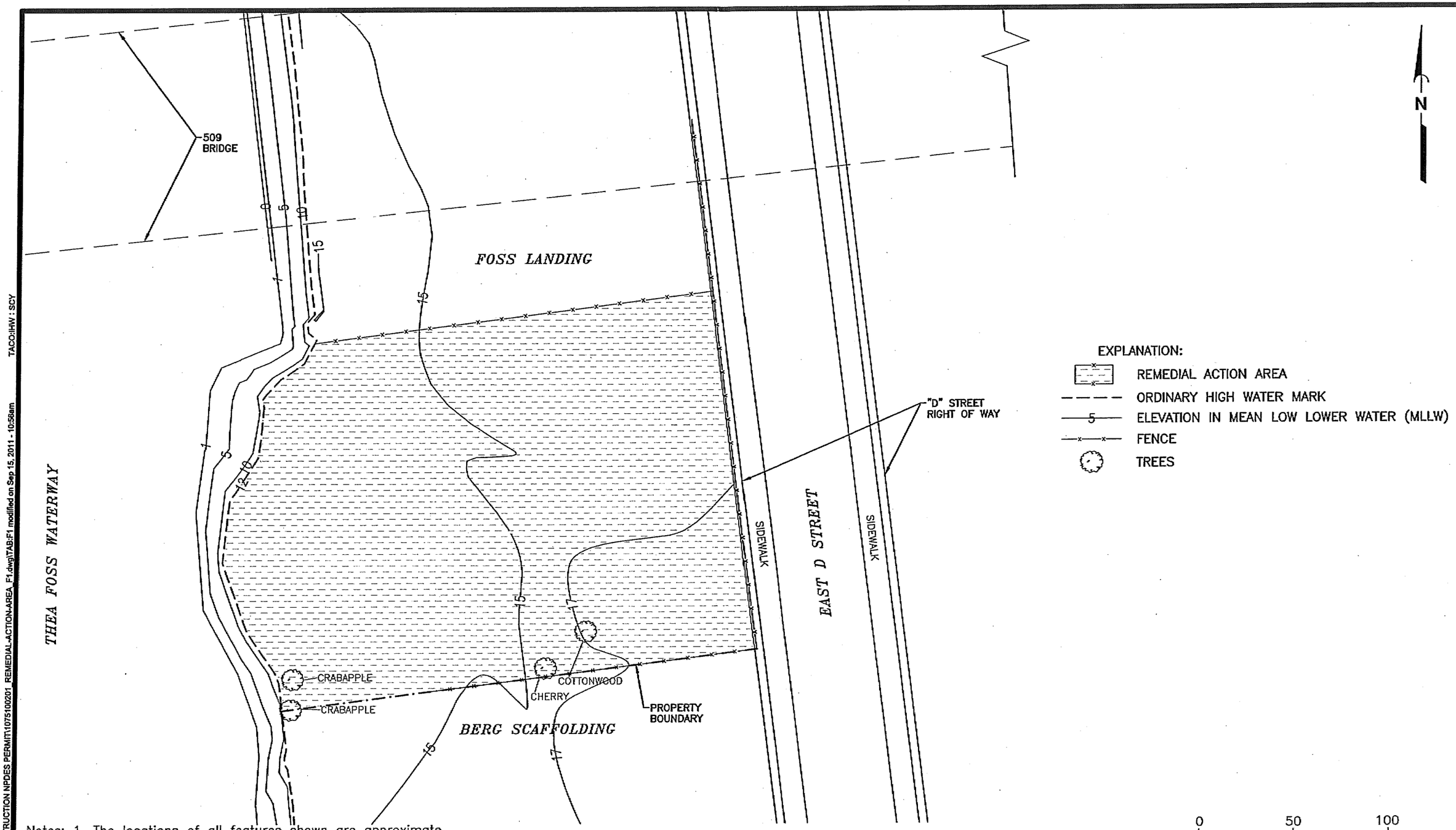
Notes:
1. The locations of all features shown are approximate.
2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.
3. Elevation datum shown is Mean Lower Low Water (MLLW).

Reference: Information and sample locations provided by Marv Coleman, Ecology Personal Communication November 10, 2003.

GeoEngineers

INTERIM ACTION TOTAL METALS

FIGURE 3



Notes: 1. The locations of all features shown are approximate.
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3. Elevation datum shown is Mean Lower Low Water (MLLW).

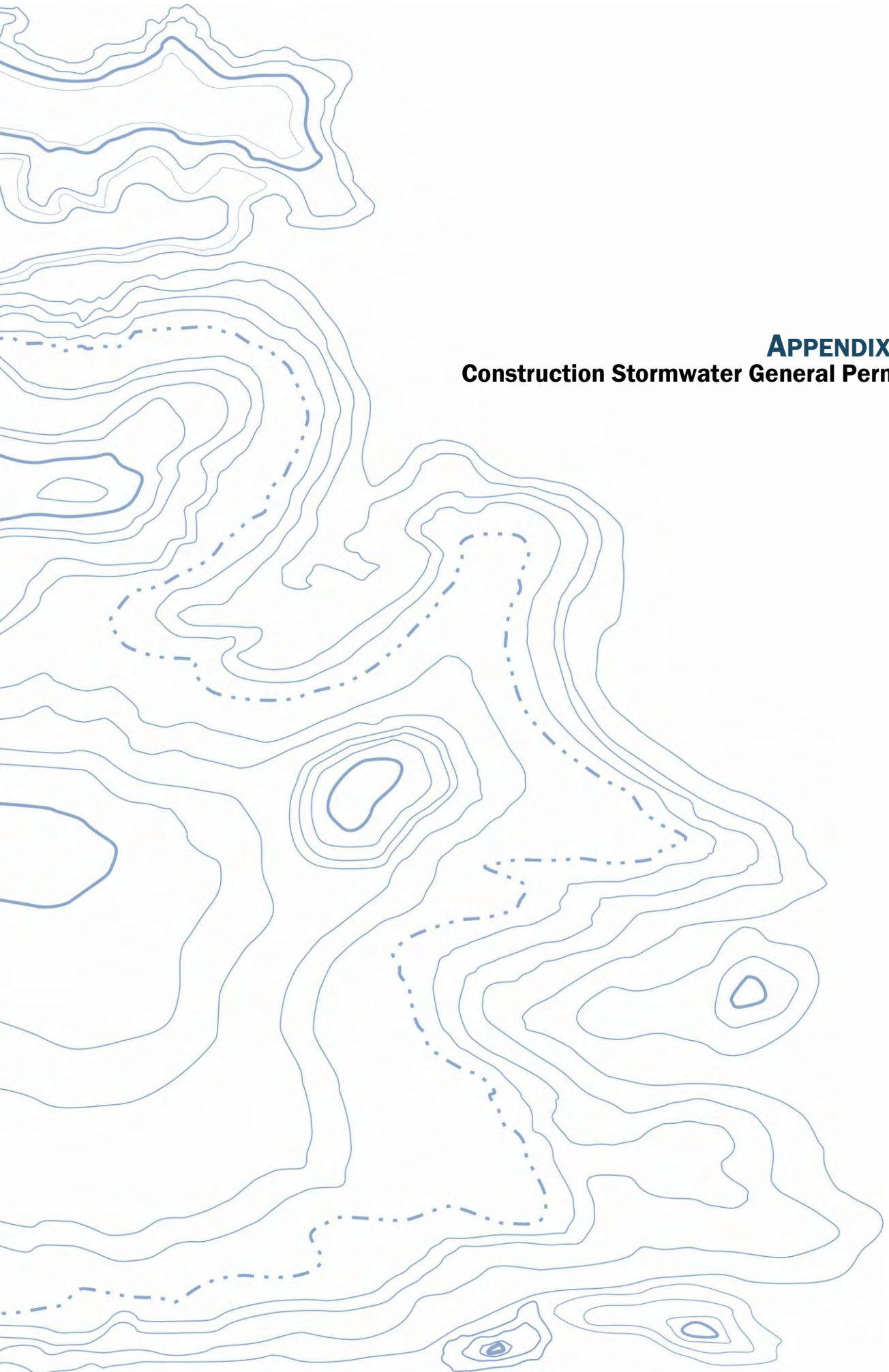
Reference: Information provided by Marv Coleman, Ecology Personal Communication November 10, 2003.

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REMEDIAL ACTION AREA

FIGURE 1

P:\101\075\002\01\CAD\CONSTRUCTION NPDES PERMIT\101075100201_REMEDIAL-ACTION-AREA_F1.dwg\TAB:F1 modified on Sep 15, 2011 - 10:56am TACO:HW : SCY



APPENDIX E
Construction Stormwater General Permit

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
TTY 711 or 800-833-6388 (for the speech or hearing impaired)

RECEIVED
DEC 19 2011

December 15, 2011

Su Dowie
Foss Waterway Development Authority
535 E Dock Street #204
Tacoma, WA 98402-4630

RE: Coverage under the Construction Stormwater General Permit

Permit number:	**WAR-125447**
Site Name:	**American Plating Remediation Project**
Location:	**2110 East D St**
	Tacoma, WA **County: Pierce**
Disturbed Acres:	**1.4**

Dear Ms. Dowie:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (permit). This is your permit coverage letter. Your permit coverage is effective on December 15, 2011. **Please retain this permit coverage letter with your permit (enclosed), stormwater pollution prevention plan (SWPPP), and site log book. These materials are the official record of permit coverage for your site.**

Please take time to read the entire permit and contact Ecology if you have any questions.

Appeal Process
You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this letter. This appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do the following within 30 days of the date of receipt of this letter:

- File your appeal and a copy of the permit cover page with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and the permit cover page on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Address and Location Information:

Street Addresses:	**Mailing Addresses:**
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board (PCHB) 1111 Israel Road SW, Suite 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

Electronic Discharge Monitoring Reports (WAWebDMR)
This permit requires that Permittees submit monthly discharge monitoring reports (DMRs) electronically using Ecology's secure online system, WAWebDMR. To sign up for WAWebDMR go to: www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html. If you have questions, contact Tonya Wolfe at (360) 407-7097 (locally), or (800) 633-6193/option 3, or email WAWebDMR@ecy.wa.gov.

Ecology Field Inspector Assistance
If you have questions regarding stormwater management at your construction site, please contact Stephanie Jackson of Ecology's Southwest Regional Office in Lacey at (360) 407-6294, or stephanie.jackson@ecy.wa.gov.

Questions or Additional Information
Ecology is committed to providing assistance. Please review our web page at: www.ecy.wa.gov/programs/wq/stormwater/construction/. If you have questions about the construction stormwater general permit, please contact Josh Klimek at (360) 407-7451, or josh.klimek@ecy.wa.gov.

Sincerely,

Bill Moore, P.E.
Program Development Services, Section Manager
Water Quality Program

Enclosure

Issuance Date: December 1, 2010
Effective Date: January 1, 2011
Expiration Date: December 31, 2015

CONSTRUCTION STORMWATER GENERAL PERMIT

National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity

State of Washington
Department of Ecology
Olympia, Washington 98504

In compliance with the provisions of
Chapter 90.48 Revised Code of Washington
(State of Washington Water Pollution Control Act)
and
Title 33 United States Code, Section 1251 et seq.
The Federal Water Pollution Control Act (The Clean Water Act)

Until this permit expires, is modified or revoked, Permittees that have properly obtained coverage under this general permit are authorized to discharge in accordance with the special and general conditions that follow.

Kelly Susewind, P.E., P.G.
Water Quality Program Manager
Washington State Department of Ecology

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SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions within this permit for additional submittal requirements. Appendix A provides a list of definitions. Appendix B provides a list of acronyms.

Table 1. Summary of Permit Report Submittals

Permit Section	Submittal	Frequency	First Submittal Date
S5.A and S8	High Turbidity/Transparency Phone Reporting	As Necessary	Within 24 hours
S5.B	Discharge Monitoring Report	Monthly*	Within 15 days of applicable monitoring period
S5.F and S8	Noncompliance Notification	As necessary	Immediately
S5.F	Noncompliance Notification – Written Report	As necessary	Within 5 Days of non-compliance
G2.	Notice of Change in Authorization	As necessary	
G6.	Permit Application for Substantive Changes to the Discharge	As necessary	
G8.	Application for Permit Renewal	1/permit cycle	No later than 180 days before expiration
G9.	Notice of Permit Transfer	As necessary	
G20.	Notice of Planned Changes	As necessary	
G22.	Reporting Anticipated Non-compliance	As necessary	

SPECIAL NOTE: *Permittees must submit Discharge Monitoring Reports (DMRs) to the Washington State Department of Ecology monthly, regardless of site discharge, for the full duration of permit coverage. Refer to Section S5.B of this General Permit for more specific information regarding DMRs.

Table 2. Summary of Required On-site Documentation

Document Title	Permit Conditions
Permit Coverage Letter	See Conditions S2, S5
Construction Stormwater General Permit	See Conditions S2, S5
Site Log Book	See Conditions S4, S5
Stormwater Pollution Prevention Plan (SWPPP)	See Conditions S9, S5

SPECIAL CONDITIONS

S1. PERMIT COVERAGE

A. Permit Area

This Construction Stormwater General Permit (CSWGP) covers all areas of Washington State, except for federal and Tribal lands as specified in Special Condition S1.E.3.

B. Operators Required to Seek Coverage Under this General Permit:

1. Operators of the following construction activities are required to seek coverage under this CSWGP:

   a. Clearing, grading and/or excavation that results in the disturbance of one or more acres and discharges stormwater to surface waters of the State; and clearing, grading and/or excavation on sites smaller than one acre that are part of a larger common plan of development or sale, if the common plan of development or sale will ultimately disturb one acre or more and discharge stormwater to surface waters of the State.

      i. This includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, and discharge to surface waters of the State (that is, forest practices that prepare a site for construction activities); and

   b. Any size construction activity discharging stormwater to waters of the State that the Department of Ecology ("Ecology"):

      i. Determines to be a significant contributor of pollutants to waters of the State of Washington.

      ii. Reasonably expects to cause a violation of any water quality standard.

2. Operators of the following activities are not required to seek coverage under this CSWGP (unless specifically required under Special Condition S1.B.1.b. above):

   a. Construction activities that discharge all stormwater and non-stormwater to ground water, sanitary sewer, or combined sewer, and have no point source discharge to either surface water or a storm sewer system that drains to surface waters of the State.

   b. Construction activities covered under an Erosivity Waiver (Special Condition S2.C).

   c. Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

C. Authorized Discharges:

1. Stormwater Associated with Construction Activity. Subject to compliance with the terms and conditions of this permit, Permittees are authorized to discharge stormwater associated with construction activity to surface waters of the State or to a storm sewer system that drains to surface waters of the State. (Note that "surface waters of the State" may exist on a construction site as well as off site; for example, a creek running through a site.)

2. Stormwater Associated with Construction Support Activity. This permit also authorizes stormwater discharge from support activities related to the permitted construction site (for example, an on-site portable rock crusher, off-site equipment staging yards, material storage areas, borrow areas, etc.) provided:

   a. The support activity relates directly to the permitted construction site that is required to have a NPDES permit; and

   b. The support activity is not a commercial operation serving multiple unrelated construction projects, and does not operate beyond the completion of the construction activity; and

   c. Appropriate controls and measures are identified in the Stormwater Pollution Prevention Plan (SWPPP) for the discharges from the support activity areas.

3. Non-Stormwater Discharges. The categories and sources of non-stormwater discharges identified below are authorized conditionally, provided the discharge is consistent with the terms and conditions of this permit:

   a. Discharges from fire-fighting activities.

   b. Fire hydrant system flushing.

   c. Potable water, including uncontaminated water line flushing.

   d. Pipeline hydrostatic test water.

   e. Uncontaminated air conditioning or compressor condensate.

   f. Uncontaminated ground water or spring water.

   g. Uncontaminated excavation dewatering water (in accordance with S9.D.10).

   h. Uncontaminated discharges from foundation or footing drains.

   i. Water used to control dust. Permittees must minimize the amount of dust control water used.

   j. Routine external building wash down that does not use detergents.

   k. Landscape irrigation water.

   The SWPPP must adequately address all authorized non-stormwater discharges, except for discharges from fire-fighting activities, and must comply with Special

Condition S3. At a minimum, discharges from potable water (including water line flushing), fire hydrant system flushing, and pipeline hydrostatic test water must undergo the following: dechlorination to a concentration of 0.1 parts per million (ppm) or less, and pH adjustment to within 6.5 – 8.5 standard units (su), if necessary.

D. Prohibited Discharges:

The following discharges to waters of the State, including ground water, are prohibited.

1. Concrete wastewater.
2. Wastewater from washout and clean-up of stucco, paint, form release oils, curing compounds and other construction materials.
3. Process wastewater as defined by 40 Code of Federal Regulations (CFR) 122.1 (see Appendix A of this permit).
4. Slurry materials and waste from shaft drilling.
5. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.
6. Soaps or solvents used in vehicle and equipment washing.
7. Wheel wash wastewater, unless discharged according to Special Condition S9.D.9.d.
8. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed according to Special Condition S9.D.10.

E. Limits on Coverage

Ecology may require any discharger to apply for and obtain coverage under an individual permit or another more specific general permit. Such alternative coverage will be required when Ecology determines that this CSWGP does not provide adequate assurance that water quality will be protected, or there is a reasonable potential for the project to cause or contribute to a violation of water quality standards.

The following stormwater discharges are not covered by this permit:

1. Post-construction stormwater discharges that originate from the site after completion of construction activities and the site has undergone final stabilization.
2. Non-point source silvicultural activities such as nursery operations, site preparation, reforestation and subsequent cultural treatment, thinning, prescribed burning, pest and fire control, harvesting operations, surface drainage, or road construction and maintenance, from which there is natural runoff as excluded in 40 CFR Subpart 122.
3. Stormwater from any federal project or project on federal land or land within an Indian Reservation except for the Puyallup Reservation. Within the Puyallup

Reservation, any project that discharges to surface water on land held in trust by the federal government may be covered by this permit.

4. Stormwater from any site covered under an existing NPDES individual permit in which stormwater management and/or treatment requirements are included for all stormwater discharges associated with construction activity.

5. Stormwater from a site where an applicable Total Maximum Daily Load (TMDL) requirement specifically precludes or prohibits discharges from construction activity.

S2. APPLICATION REQUIREMENTS

A. Permit Application Forms

1. Notice of Intent Form/Timeline

a. Operators of new or previously unpermitted construction activities must submit a complete and accurate permit application (Notice of Intent, or NOI) to Ecology.

b. The operator must submit the NOI at least 60 days before discharging stormwater from construction activities and must submit it on or before the date of the first public notice (see Special Condition S2.B below for details). The 30-day public comment period required by WAC 173-226-130(5) begins on the publication date of the second public notice. Unless Ecology responds to the complete application in writing, based on public comments, or any other relevant factors, coverage under the general permit will automatically commence on the thirty-first day following receipt by Ecology of a completed NOI, or the issuance date of this permit, whichever is later, unless Ecology specifies a later date in writing.

c. Applicants who propose to discharge to a storm or sewer system operated by Seattle, King County, Snohomish County, Tacoma, Pierce County, or Clark County must also submit a copy of the NOI to the appropriate jurisdiction.

d. If an applicant intends to use a Best Management Practice (BMP) selected on the basis of Special Condition S9.C.4 ("demonstrably equivalent" BMPs), the applicant must notify Ecology of its selection as part of the NOI. In the event the applicant selects BMPs after submission of the NOI, it must provide notice of the selection of an equivalent BMP to Ecology at least 60 days before intended use of the equivalent BMP.

e. Permittees must notify Ecology regarding any changes to the information provided on the NOI by submitting an updated NOI. Examples of such changes include, but are not limited to,

i. changes to the Permittee's mailing address,

ii. changes to the on-site contact person information, and

iii. changes to the area/acreage affected by construction activity.

2. Transfer of Coverage Form

The Permittee can transfer current coverage under this permit to one or more new operators, including operators of sites within a Common Plan of Development, provided the Permittee submits a Transfer of Coverage Form in accordance with General Condition G9. Transfers do not require public notice.

B. Public Notice

For new or previously unpermitted construction activities, the applicant must publish a public notice at least one time each week for two consecutive weeks, at least 7 days apart, in a newspaper with general circulation in the county where the construction is to take place. The notice must contain:

1. A statement that "The applicant is seeking coverage under the Washington State Department of Ecology's Construction Stormwater NPDES and State Waste Discharge General Permit."

2. The name, address and location of the construction site.

3. The name and address of the applicant.

4. The type of construction activity that will result in a discharge (for example, residential construction, commercial construction, etc.), and the number of acres to be disturbed.

5. The name of the receiving water(s) (that is, the surface water(s) to which the site will discharge), or, if the discharge is through a storm sewer system, the name of the operator of the system.

6. The statement: "Any persons desiring to present their views to the Washington State Department of Ecology regarding this application, or interested in Ecology's action on this application, may notify Ecology in writing no later than 30 days of the last date of publication of this notice. Ecology reviews public comments and considers whether discharges from this project would cause a measurable change in receiving water quality, and, if so, whether the project is necessary and in the overriding public interest according to Tier II antidegradation requirements under WAC 173-201A-320. Comments can be submitted to: Department of Ecology, P.O. Box 47696, Olympia, WA 98504-7696 Attn: Water Quality Program, Construction Stormwater."

C. Erosivity Waiver

Construction site operators may qualify for an erosivity waiver from the CSWGP if the following conditions are met:

1. The site will result in the disturbance of fewer than 5 acres and the site is not a portion of a common plan of development or sale that will disturb 5 acres or greater.

2. Calculation of Erosivity "R" Factor and Regional Timeframe:

   a. The project's rainfall erosivity factor ("R" Factor) must be less than 5 during the period of construction activity, as calculated using either the Texas A&M University online rainfall erosivity calculator at: http://ei.tamu.edu/ or EPA's calculator at http://cfpub.epa.gov/npdes/stormwater/lew/lewcalculator.cfm. The period of construction activity starts when the land is first disturbed and ends with final stabilization. In addition:

   b. The entire period of construction activity must fall within the following timeframes:

      i. For sites west of the Cascades Crest: June 15 – September 15.

      ii. For sites east of the Cascades Crest, excluding the Central Basin: June 15 – October 15.

      iii. For sites east of the Cascades Crest, within the Central Basin: no additional timeframe restrictions apply. The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches. For a map of the Central Basin (Region 2), refer to http://www.ecy.wa.gov/pubs/ecy070202.pdf.

3. Construction site operators must submit a complete Erosivity Waiver certification form at least one week before disturbing the land. Certification must include statements that the operator will:

   a. Comply with applicable local stormwater requirements; and

   b. Implement appropriate erosion and sediment control BMPs to prevent violations of water quality standards.

4. This waiver is not available for facilities declared significant contributors of pollutants as defined in Special Condition S1.B.1.b.

5. This waiver does not apply to construction activities which include non-stormwater discharges listed in Special Condition S1.C.3.

6. If construction activity extends beyond the certified waiver period for any reason, the operator must either:

   a. Recalculate the rainfall erosivity "R" factor using the original start date and a new projected ending date and, if the "R" factor is still under 5 and the entire

project falls within the applicable regional timeframe in Special Condition S2.C.2.b, complete and submit an amended waiver certification form before the original waiver expires; or

b. Submit a complete permit application to Ecology in accordance with Special Condition S2.A and B before the end of the certified waiver period.

S3. COMPLIANCE WITH STANDARDS

A. Discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), ground water quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health-based criteria in the National Toxics Rule (40 CFR Part 131.36). Discharges not in compliance with these standards are not authorized.

B. Prior to the discharge of stormwater and non-stormwater to waters of the State, the Permittee must apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

C. Ecology presumes that a Permittee complies with water quality standards unless discharge monitoring data or other site-specific information demonstrates that a discharge causes or contributes to a violation of water quality standards, when the Permittee complies with the following conditions. The Permittee must fully:

1. Comply with all permit conditions, including planning, sampling, monitoring, reporting, and recordkeeping conditions.

2. Implement stormwater BMPs contained in stormwater management manuals published or approved by Ecology, or BMPs that are demonstrably equivalent to BMPs contained in stormwater technical manuals published or approved by Ecology, including the proper selection, implementation, and maintenance of all applicable and appropriate BMPs for on-site pollution control. (For purposes of this section, the stormwater manuals listed in Appendix 10 of the Phase I Municipal Stormwater Permit are approved by Ecology.)

D. Where construction sites also discharge to ground water, the ground water discharges must also meet the terms and conditions of this CSWGP. Permittees who discharge to ground water through an injection well must also comply with any applicable requirements of the Underground Injection Control (UIC) regulations, Chapter 173-218 WAC.

S4. MONITORING REQUIREMENTS, BENCHMARKS AND REPORTING TRIGGERS

Table 3. Summary of Primary Monitoring Requirements

Size of Soil Disturbance[1]	Weekly Site Inspections	Weekly Sampling w/ Turbidity Meter	Weekly Sampling w/ Transparency Tube	Weekly pH Sampling[2]	Requires CESCL Certification?
Sites that disturb less than 1 acre, but are part of a larger Common Plan of Development	Required	Not Required	Not Required	Not Required	No
Sites that disturb 1 acre or more, but fewer than 5 acres	Required	Sampling Required – either method[3]		Required	Yes
Sites that disturb 5 acres or more	Required	Required	Not Required[4]	Required	Yes

A. Site Log Book

The Permittee must maintain a site log book that contains a record of the implementation of the SWPPP and other permit requirements, including the installation and maintenance of BMPs, site inspections, and stormwater monitoring.

B. Site Inspections

The Permittee's (operator's) site inspections must include all areas disturbed by construction activities, all BMPs, and all stormwater discharge points. (See Special Conditions S4.B.3 and B.4 below for detailed requirements of the Permittee's Certified Erosion and Sediment Control Lead [CESCL]).

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[1] Soil disturbance is calculated by adding together all areas affected by construction activity. Construction activity means clearing, grading, excavation, and any other activity that disturbs the surface of the land, including ingress/egress from the site.

[2] If construction activity results in the disturbance of 1 acre or more, and involves significant concrete work (1,000 cubic yards of poured or recycled concrete over the life of a project) or the use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area drains to surface waters of the State or to a storm sewer stormwater collection system that drains to other surface waters of the State, the Permittee must conduct pH monitoring sampling in accordance with Special Condition S4.D.

[3] Sites with one or more acres, but fewer than 5 acres of soil disturbance, must conduct turbidity or transparency sampling in accordance with Special Condition S4.C.

[4] Sites equal to or greater than 5 acres of soil disturbance must conduct turbidity sampling using a turbidity meter in accordance with Special Condition S4.C.

Construction sites one acre or larger that discharge stormwater to surface waters of the State must have site inspections conducted by a certified CESCL. Sites less than one acre may have a person without CESCL certification conduct inspections; sampling is not required on sites that disturb less than an acre.

1. The Permittee must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen. The Permittee must evaluate the effectiveness of BMPs and determine if it is necessary to install, maintain, or repair BMPs to improve the quality of stormwater discharges.

   Based on the results of the inspection, the Permittee must correct the problems identified by:

   a. Reviewing the SWPPP for compliance with Special Condition S9 and making appropriate revisions within 7 days of the inspection.

   b. Immediately beginning the process of fully implementing and maintaining appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than within 10 days of the inspection. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period.

   c. Documenting BMP implementation and maintenance in the site log book.

2. The Permittee must inspect all areas disturbed by construction activities, all BMPs, and all stormwater discharge points at least once every calendar week and within 24 hours of any discharge from the site. (For purposes of this condition, individual discharge events that last more than one day do not require daily inspections. For example, if a stormwater pond discharges continuously over the course of a week, only one inspection is required that week.) The Permittee may reduce the inspection frequency for temporarily stabilized, inactive sites to once every calendar month.

3. The Permittee must have staff knowledgeable in the principles and practices of erosion and sediment control. The CESCL (sites one acre or more) or inspector (sites less than one acre) must have the skills to assess the:

   a. Site conditions and construction activities that could impact the quality of stormwater, and

   b. Effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

4. The SWPPP must identify the CESCL or inspector, who must be present on site or on-call at all times. The CESCL must obtain this certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (see BMP C160 in the manual referred to in Special Condition S9.C.1 and 2).

5. The Permittee must summarize the results of each inspection in an inspection report or checklist and enter the report/checklist into, or attach it to, the site log book. At a minimum, each inspection report or checklist must include:

   a. Inspection date and time.

   b. Weather information, the general conditions during inspection and the approximate amount of precipitation since the last inspection, and precipitation within the last 24 hours.

   c. A summary or list of all implemented BMPs, including observations of all erosion/sediment control structures or practices.

   d. A description of the locations:

      i. Of BMPs inspected.

      ii. Of BMPs that need maintenance and why.

      iii. Of BMPs that failed to operate as designed or intended, and

      iv. Where additional or different BMPs are needed, and why.

   e. A description of stormwater discharged from the site. The Permittee must note the presence of suspended sediment, turbidity, discoloration, and oil sheen, as applicable.

   f. Any water quality monitoring performed during inspection.

   g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made following the inspection.

   h. A summary report and a schedule of implementation of the remedial actions that the Permittee plans to take if the site inspection indicates that the site is out of compliance. The remedial actions taken must meet the requirements of the SWPPP and the permit.

   i. The name, title, and signature of the person conducting the site inspection, a phone number or other reliable method to reach this person, and the following statement: "I certify that this report is true, accurate, and complete to the best of my knowledge and belief."

C. Turbidity/Transparency Sampling Requirements

1. Sampling Methods

   a. If construction activity involves the disturbance of 5 acres or more, the Permittee must conduct turbidity sampling per Special Condition S4.C.

   b. If construction activity involves 1 acre or more but fewer than 5 acres of soil disturbance, the Permittee must conduct either transparency sampling **or** turbidity sampling per Special Condition S4.C.

2. Sampling Frequency

   a. The Permittee must sample all discharge locations at least once every calendar week when stormwater (or authorized non-stormwater) discharges from the site or enters any on-site surface waters of the state (for example, a creek running through a site).

   b. Samples must be representative of the flow and characteristics of the discharge.

   c. Sampling is not required when there is no discharge during a calendar week.

   d. Sampling is not required outside of normal working hours or during unsafe conditions.

   e. If the Permittee is unable to sample during a monitoring period, the Permittee must include a brief explanation in the monthly Discharge Monitoring Report (DMR).

   f. Sampling is not required before construction activity begins.

3. Sampling Locations

   a. Sampling is required at all points where stormwater associated with construction activity (or authorized non-stormwater) is discharged off site, including where it enters any on-site surface waters of the state (for example, a creek running through a site).

   b. The Permittee may discontinue sampling at discharge points that drain areas of the project that are fully stabilized to prevent erosion.

   c. The Permittee must identify all sampling point(s) on the SWPPP site map and clearly mark these points in the field with a flag, tape, stake or other visible marker.

   d. Sampling is not required for discharge that is sent directly to sanitary or combined sewer systems.

4. Sampling and Analysis Methods

   a. The Permittee performs turbidity analysis with a calibrated turbidity meter (turbidimeter) either on site or at an accredited lab. The Permittee must record the results in the site log book in nephelometric turbidity units (NTU).

   b. The Permittee performs transparency analysis on site with a 1¾-inch-diameter, 60-centimeter (cm)-long transparency tube. The Permittee will record the results in the site log book in centimeters (cm). Transparency tubes are available from: http://watermonitoringequip.com/pages/stream.html.

Table 4. Monitoring and Reporting Requirements

Parameter	Unit	Analytical Method	Sampling Frequency	Benchmark Value	Phone Reporting Trigger Value
Turbidity	NTU	SM2130 or EPA 180.1	Weekly, if discharging	25 NTU	250 NTU
Transparency	cm	Manufacturer instructions, or Ecology guidance	Weekly, if discharging	33 cm	6 cm

5. Turbidity/Transparency Benchmark Values and Reporting Triggers

The benchmark value for turbidity is 25 NTU or less. The benchmark value for transparency is 33 centimeters (cm). Note: Benchmark values do not apply to discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus; these discharges are subject to a numeric effluent limit for turbidity. Refer to Special Condition S8 for more information.

a. Turbidity 26 – 249 NTU, or Transparency 32 – 7 cm:

If the discharge turbidity is 26 to 249 NTU; or if discharge transparency is less than 33 cm, but equal to or greater than 6 cm, the Permittee must:

i. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.

ii. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.

iii. Document BMP implementation and maintenance in the site log book.

b. Turbidity 250 NTU or greater, or Transparency 6 cm or less:

If a discharge point's turbidity is 250 NTU or greater, or if discharge transparency is less than or equal to 6 cm, the Permittee must complete the reporting and adaptive management process described below.

i. Telephone the applicable Ecology Region's Environmental Report Tracking System (ERTS) number within 24 hours, in accordance with Special Condition S5.F.

- Central Region (Okanogan, Chelan, Douglas, Kittitas, Yakima, Klickitat, Benton): (509) 575-2490

- Eastern Region (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400
- Northwest Region (Kitsap, Snohomish, Island, King, San Juan, Skagit, Whatcom): (425) 649-7000
- Southwest Region (Grays Harbor, Lewis, Mason, Thurston, Pierce, Clark, Cowlitz, Skamania, Wahkiakum, Clallam, Jefferson, Pacific): (360) 407-6300

These numbers are also listed at the following web site: http://www.ecy.wa.gov/programs/wq/stormwater/construction/permit.html

ii. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.

iii. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.

iv. Document BMP implementation and maintenance in the site log book.

v. Continue to sample discharges daily until:

a) Turbidity is 25 NTU (or lower); or

b) Transparency is 33 cm (or greater); or

c) The Permittee has demonstrated compliance with the water quality limit for turbidity:

1) No more than 5 NTU over background turbidity, if background is less than 50 NTU, or

2) No more than 10% over background turbidity, if background is 50 NTU or greater; or

d) The discharge stops or is eliminated.

D. pH Sampling Requirements -- Significant Concrete Work or Engineered Soils

If construction activity results in the disturbance of 1 acre or more, **and** involves significant concrete work (significant concrete work means greater than 1000 cubic yards poured concrete or recycled concrete used over the life of a project) or the use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area

drains to surface waters of the State or to a storm sewer system that drains to surface waters of the state, the Permittee must conduct pH monitoring as set forth below. Note: In addition, discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for high pH are subject to a numeric effluent limit for pH; refer to Special Condition S8.

1. For sites with significant concrete work, the Permittee must begin the pH monitoring period when the concrete is first poured and exposed to precipitation, and continue weekly throughout and after the concrete pour and curing period, until stormwater pH is in the range of 6.5 to 8.5 (su).

2. For sites with engineered soils, the Permittee must begin the pH monitoring period when the soil amendments are first exposed to precipitation and must continue until the area of engineered soils is fully stabilized.

3. During the applicable pH monitoring period defined above, the Permittee must obtain a representative sample of stormwater and conduct pH analysis at least once per week.

4. The Permittee must monitor pH in the sediment trap/pond(s) or other locations that receive stormwater runoff from the area of significant concrete work or engineered soils before the stormwater discharges to surface waters.

5. The benchmark value for pH is 8.5 standard units. Anytime sampling indicates that pH is 8.5 or greater, the Permittee must either:

   a. Prevent the high pH water (8.5 or above) from entering storm sewer systems or surface waters; or

   b. If necessary, adjust or neutralize the high pH water until it is in the range of pH 6.5 to 8.5 (su) using an appropriate treatment BMP such as carbon dioxide (CO_2) sparging or dry ice. The Permittee must obtain written approval from Ecology before using any form of chemical treatment other than CO_2 sparging or dry ice.

6. The Permittee must perform pH analysis on site with a calibrated pH meter, pH test kit, or wide range pH indicator paper. The Permittee must record pH monitoring results in the site log book.

S5. REPORTING AND RECORDKEEPING REQUIREMENTS

A. High Turbidity Phone Reporting

Anytime sampling performed in accordance with Special Condition S4.C indicates turbidity has reached the 250 NTU phone reporting level, the Permittee must call Ecology's Regional office by phone within 24 hours of analysis. The web site is http://www.ecy.wa.gov/programs/wq/stormwater/construction/permit.html. Also see phone numbers in Special Condition S4.C.5.b.i.

B. Discharge Monitoring Reports

Permittees required to conduct water quality sampling in accordance with Special Conditions S4.C (Turbidity/Transparency), S4.D (pH), S8 (303[d]/TMDL sampling), and/or G13 (Additional Sampling) must submit the results to Ecology.

Permittees must submit monitoring data using Ecology's WebDMR program. To find out more information and to sign up for WebDMR go to: http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html.

Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper copy DMR at:

Mailing Address:
Department of Ecology
Water Quality Program
Attn: Stormwater Compliance Specialist
PO Box 47696
Olympia, WA 98504-7696

Permittees who obtain a waiver not to use WebDMR must use the forms provided to them by Ecology; submittals must be mailed to the address above. Permittees shall submit DMR forms to be received by Ecology within 15 days following the end of each month.

If there was no discharge during a given monitoring period, all Permittees must submit a DMR as required with "no discharge" entered in place of the monitoring results. For more information, contact Ecology staff using information provided at the following web site: http://www.ecy.wa.gov/programs/spills/response/assistancesoil%20map.pdf

C. Records Retention

The Permittee must retain records of all monitoring information (site log book, sampling results, inspection reports/checklists, etc.), Stormwater Pollution Prevention Plan, and any other documentation of compliance with permit requirements for the entire life of the construction project and for a minimum of three years following the termination of permit coverage. Such information must include all calibration and maintenance records, and records of all data used to complete the application for this

permit. This period of retention must be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

D. Recording Results

For each measurement or sample taken, the Permittee must record the following information:

1. Date, place, method, and time of sampling or measurement.
2. The first and last name of the individual who performed the sampling or measurement.
3. The date(s) the analyses were performed.
4. The first and last name of the individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all analyses.

E. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by this permit using test procedures specified by Special Condition S4 of this permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the Permittee's DMR.

F. Noncompliance Notification

In the event the Permittee is unable to comply with any part of the terms and conditions of this permit, and the resulting noncompliance may cause a threat to human health or the environment, the Permittee must:

1. Immediately notify Ecology of the failure to comply by calling the applicable Regional office ERTS phone number (find at http://www.ecy.wa.gov/programs/spills/response/assistancesoil%20map.pdf) or refer to Special Condition S4.C.5.b.i.
2. Immediately take action to prevent the discharge/pollution, or otherwise stop or correct the noncompliance, and, if applicable, repeat sampling and analysis of any noncompliance immediately and submit the results to Ecology within five (5) days of becoming aware of the violation.
3. Submit a detailed written report to Ecology within five (5) days, unless requested earlier by Ecology. The report must contain a description of the noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The Permittee must report any unanticipated bypass and/or upset that exceeds any effluent limit in the permit in accordance with the 24-hour reporting requirement contained in 40 C.F.R. 122.41(l)(6)).

Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply. Refer to Section G14 of this permit for specific information regarding non-compliance.

G. Access to Plans and Records

1. The Permittee must retain the following permit documentation (plans and records) on site, or within reasonable access to the site, for use by the operator or for on-site review by Ecology or the local jurisdiction:

   a. General Permit.

   b. Permit Coverage Letter.

   c. Stormwater Pollution Prevention Plan (SWPPP).

   d. Site Log Book.

2. The Permittee must address written requests for plans and records listed above (Special Condition S5.G.1) as follows:

   a. The Permittee must provide a copy of plans and records to Ecology within 14 days of receipt of a written request from Ecology.

   b. The Permittee must provide a copy of plans and records to the public when requested in writing. Upon receiving a written request from the public for the Permittee's plans and records, the Permittee must either:

      i. Provide a copy of the plans and records to the requester within 14 days of a receipt of the written request; or

      ii. Notify the requester within 10 days of receipt of the written request of the location and times within normal business hours when the plans and records may be viewed; and provide access to the plans and records within 14 days of receipt of the written request; or

      Within 14 days of receipt of the written request, the Permittee may submit a copy of the plans and records to Ecology for viewing and/or copying by the requester at an Ecology office, or a mutually agreed location. If plans and records are viewed and/or copied at a location other than at an Ecology office, the Permittee will provide reasonable access to copying services for which a reasonable fee may be charged. The Permittee must notify the requester within 10 days of receipt of the request where the plans and records may be viewed and/or copied.

S6. PERMIT FEES

The Permittee must pay permit fees assessed by Ecology. Fees for stormwater discharges covered under this permit are established by Chapter 173-224 WAC. Ecology continues to assess permit fees until the permit is terminated in accordance with Special Condition S10 or revoked in accordance with General Condition G5.

S7. SOLID AND LIQUID WASTE DISPOSAL

The Permittee must handle and dispose of solid and liquid wastes generated by construction activity, such as demolition debris, construction materials, contaminated materials, and waste materials from maintenance activities, including liquids and solids from cleaning catch basins and other stormwater facilities, in accordance with:

A. Special Condition S3, Compliance with Standards.

B. WAC 173-216-110.

C. Other applicable regulations.

S8. DISCHARGES TO 303(D) OR TMDL WATER BODIES

A. Sampling and Numeric Effluent Limits For Certain Discharges to 303(d)-listed Water Bodies

1. Permittees who discharge to segments of water bodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH, or phosphorus, must conduct water quality sampling according to the requirements of this section, and Special Conditions S4.C.2.b-f and S4.C.3.b-d, and must comply with the applicable numeric effluent limitations in S8.C and S8.D.

2. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current listing by Ecology of impaired waters (Category 5) that exists on January 1, 2011, or the date when the operator's complete permit application is received by Ecology, whichever is later.

B. Limits on Coverage for New Discharges to TMDL or 303(d)-listed Waters

Operators of construction sites that discharge to a 303(d)-listed water body are not eligible for coverage under this permit *unless* the operator:

1. Prevents exposing stormwater to pollutants for which the water body is impaired, and retains documentation in the SWPPP that details procedures taken to prevent exposure on site; or

2. Documents that the pollutants for which the water body is impaired are not present at the site, and retains documentation of this finding within the SWPPP; or

3. Provides Ecology with data indicating the discharge is not expected to cause or contribute to an exceedance of a water quality standard, and retains such data on site with the SWPPP. The operator must provide data and other technical information to Ecology that sufficiently demonstrate:

   a. For discharges to waters without an EPA-approved or -established TMDL, that the discharge of the pollutant for which the water is impaired will meet in-stream water quality criteria at the point of discharge to the water body; or

   b. For discharges to waters with an EPA-approved or -established TMDL, that there is sufficient remaining wasteload allocation in the TMDL to allow construction stormwater discharge and that existing dischargers to the water body are subject to compliance schedules designed to bring the water body into attainment with water quality standards.

   Operators of construction sites are eligible for coverage under this permit if Ecology issues permit coverage based upon an affirmative determination that the discharge will not cause or contribute to the existing impairment.

C. Sampling and Numeric Effluent Limits for Discharges to Water Bodies on the 303(d) List for Turbidity, Fine Sediment, or Phosphorus

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus must conduct turbidity sampling in accordance with Special Condition S4.C.2 and comply with either of the numeric effluent limits noted in Table 5 below.

2. As an alternative to the 25 NTU effluent limit noted in Table 5 below (applied at the point where stormwater [or authorized non-stormwater] is discharged off-site), permittees may choose to comply with the surface water quality standard for turbidity. The standard is: no more than 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or no more than a 10% increase in turbidity when the background turbidity is more than 50 NTU. In order to use the water quality standard requirement, the sampling must take place at the following locations:

   a. Background turbidity in the 303(d)-listed receiving water immediately upstream (upgradient) or outside the area of influence of the discharge.

   b. Turbidity at the point of discharge into the 303(d)-listed receiving water, inside the area of influence of the discharge.

3. Discharges that exceed the numeric effluent limit for turbidity constitute a violation of this permit.

4. Permittees whose discharges exceed the numeric effluent limit shall sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

Table 5. Turbidity, Fine Sediment & Phosphorus Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled	Unit	Analytical Method	Sampling Frequency	Numeric Effluent Limit[1]
• Turbidity • Fine Sediment • Phosphorus	Turbidity	NTU	SM2130 or EPA180.1	Weekly, if discharging	25 NTU, at the point where stormwater is discharged from the site; OR In compliance with the surface water quality standard for turbidity (S8.C.1.a)

[1]Permittees subject to a numeric effluent limit for turbidity may, at their discretion, choose either numeric effluent limitation based on site-specific considerations including, but not limited to, safety, access and convenience.

D. Discharges to Water Bodies on the 303(d) List for High pH

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for high pH must conduct pH sampling in accordance with the table below, and comply with the numeric effluent limit of pH 6.5 to 8.5 su (Table 6).

Table 6. pH Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled/Units	Analytical Method	Sampling Frequency	Numeric Effluent Limit
High pH	pH /Standard Units	pH meter	Weekly, if discharging	In the range of 6.5 – 8.5

2. At the Permittee's discretion, compliance with the limit shall be assessed at one of the following locations:

   a. Directly in the 303(d)-listed water body segment, inside the immediate area of influence of the discharge; or

   b. Alternatively, the permittee may measure pH at the point where the discharge leaves the construction site, rather than in the receiving water.

3. Discharges that exceed the numeric effluent limit for pH (outside the range of 6.5 – 8.5 su) constitute a violation of this permit.

4. Permittees whose discharges exceed the numeric effluent limit shall sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

E. Sampling and Limits for Sites Discharging to Waters Covered by a TMDL or Another Pollution Control Plan

1. Discharges to a water body that is subject to a Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus must be consistent with the TMDL. Refer to http://www.ecy.wa.gov/programs/wq/tmdl/index.html for more information on TMDLs.

    a. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges must be consistent with any specific waste load allocations or requirements established by the applicable TMDL.

        i. The Permittee must sample discharges weekly or as otherwise specified by the TMDL to evaluate compliance with the specific waste load allocations or requirements.

        ii. Analytical methods used to meet the monitoring requirements must conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136. Turbidity and pH methods need not be accredited or registered unless conducted at a laboratory which must otherwise be accredited or registered.

    b. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but has not identified specific requirements, compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL.

    c. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL.

    d. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

2. Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus that is completed and approved by EPA before January 1, 2011, or before the date the operator's complete permit application is received by Ecology, whichever is later. TMDLs completed after the operator's complete permit application is received by Ecology become applicable to the Permittee only if they are imposed through an administrative order by Ecology, or through a modification of permit coverage.

S9. STORMWATER POLLUTION PREVENTION PLAN

The Permittee must prepare and properly implement an adequate Stormwater Pollution Prevention Plan (SWPPP) for construction activity in accordance with the requirements of this permit beginning with initial soil disturbance and until final stabilization.

A. The Permittee's SWPPP must meet the following objectives:

1. To implement best management practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. To prevent violations of surface water quality, ground water quality, or sediment management standards.

3. To control peak volumetric flow rates and velocities of stormwater discharges.

B. General Requirements

1. The SWPPP must include a narrative and drawings. All BMPs must be clearly referenced in the narrative and marked on the drawings. The SWPPP narrative must include documentation to explain and justify the pollution prevention decisions made for the project. Documentation must include:

   a. Information about existing site conditions (topography, drainage, soils, vegetation, etc.).

   b. Potential erosion problem areas.

   c. The 12 elements of a SWPPP in Special Condition S9.D.1-12, including BMPs used to address each element.

   d. Construction phasing/sequence and general BMP implementation schedule.

   e. The actions to be taken if BMP performance goals are not achieved—for example, a contingency plan for additional treatment and/or storage of stormwater that would violate the water quality standards if discharged.

   f. Engineering calculations for ponds and any other designed structures.

2. The Permittee must modify the SWPPP if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is, or would be, ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The Permittee must then:

   a. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the inspection or investigation.

   b. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than 10 days from the inspection or investigation. If

installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period,

c. Document BMP implementation and maintenance in the site log book.

The Permittee must modify the SWPPP whenever there is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

C. Stormwater Best Management Practices (BMPs)

BMPs must be consistent with:

1. Stormwater Management Manual for Western Washington (most recent edition), for sites west of the crest of the Cascade Mountains; or

2. Stormwater Management Manual for Eastern Washington (most recent edition), for sites east of the crest of the Cascade Mountains; or

3. Revisions to the manuals listed in Special Condition S9.C.1. & 2., or other stormwater management guidance documents or manuals which provide an equivalent level of pollution prevention, that are approved by Ecology and incorporated into this permit in accordance with the permit modification requirements of WAC 173-226-230; or

4. Documentation in the SWPPP that the BMPs selected provide an equivalent level of pollution prevention, compared to the applicable Stormwater Management Manuals, including:

   a. The technical basis for the selection of all stormwater BMPs (scientific, technical studies, and/or modeling) that support the performance claims for the BMPs being selected.

   b. An assessment of how the selected BMP will satisfy AKART requirements and the applicable federal technology-based treatment requirements under 40 CFR part 125.3.

D. SWPPP – Narrative Contents and Requirements

The Permittee must include each of the 12 elements below in Special Condition S9.D.1-12 in the narrative of the SWPPP and implement them unless site conditions render the element unnecessary and the exemption from that element is clearly justified in the SWPPP.

1. Preserve Vegetation/Mark Clearing Limits

   a. Before beginning land-disturbing activities, including clearing and grading, clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.

b. Retain the duff layer, native top soil, and natural vegetation in an undisturbed state to the maximum degree practicable.

2. Establish Construction Access

   a. Limit construction vehicle access and exit to one route, if possible.

   b. Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize tracking sediment onto roads.

   c. Locate wheel wash or tire baths on site, if the stabilized construction entrance is not effective in preventing tracking sediment onto roads.

   d. If sediment is tracked off site, clean the affected roadway thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or pickup and transport of the sediment to a controlled sediment disposal area.

   e. Conduct street washing only after sediment removal in accordance with Special Condition S9.D.2.d. Control street wash wastewater by pumping back on site or otherwise preventing it from discharging into systems tributary to waters of the State.

3. Control Flow Rates

   a. Protect properties and waterways downstream of development sites from erosion and the associated discharge of turbid waters due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site, as required by local plan approval authority.

   b. Where necessary to comply with Special Condition S9.D.3.a, construct stormwater retention or detention facilities as one of the first steps in grading. Assure that detention facilities function properly before constructing site improvements (for example, impervious surfaces).

   c. If permanent infiltration ponds are used for flow control during construction, protect these facilities from siltation during the construction phase.

4. Install Sediment Controls

   The Permittee must design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, the Permittee must design, install and maintain such controls to:

   a. Construct sediment control BMPs (sediment ponds, traps, filters, etc.) as one of the first steps in grading. These BMPs must be functional before other land disturbing activities take place.

   b. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of

resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.

c. Direct stormwater runoff from disturbed areas through a sediment pond or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must meet the flow control performance standard of Special Condition S9.D.3.a.

d. Locate BMPs intended to trap sediment on site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.

e. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible.

f. Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

5. Stabilize Soils

a. The Permittee must stabilize exposed and unworked soils by application of effective BMPs that prevent erosion. Applicable BMPs include, but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion control fabrics and matting, soil application of polyacrylamide (PAM), the early application of gravel base on areas to be paved, and dust control.

b. The Permittee must control stormwater volume and velocity within the site to minimize soil erosion.

c. The Permittee must control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion.

d. Depending on the geographic location of the project, the Permittee must not allow soils to remain exposed and unworked for more than the time periods set forth below to prevent erosion:

West of the Cascade Mountains Crest
During the dry season (May 1 - Sept. 30): 7 days
During the wet season (October 1 - April 30): 2 days

East of the Cascade Mountains Crest, except for Central Basin*
During the dry season (July 1 - September 30): 10 days
During the wet season (October 1 - June 30): 5 days

The Central Basin*, East of the Cascade Mountains Crest

During the dry Season (July 1 - September 30): 30 days
During the wet season (October 1 - June 30): 15 days

*Note: The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches.

e. The Permittee must stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.

f. The Permittee must stabilize soil stockpiles from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

g. The Permittee must minimize the amount of soil exposed during construction activity.

h. The Permittee must minimize the disturbance of steep slopes.

i. The Permittee must minimize soil compaction and, unless infeasible, preserve topsoil.

6. Protect Slopes

a. The Permittee must design and construct cut-and-fill slopes in a manner to minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (for example, track walking).

b. The Permittee must divert off-site stormwater (run-on) or ground water away from slopes and disturbed areas with interceptor dikes, pipes, and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.

c. At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.

i. West of the Cascade Mountains Crest: Temporary pipe slope drains must handle the peak 10-minute velocity of flow from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas should be modeled as "landscaped area."

ii. East of the Cascade Mountains Crest: Temporary pipe slope drains must handle the expected peak flow velocity from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.

d. Place excavated material on the uphill side of trenches, consistent with safety and space considerations.

e. Place check dams at regular intervals within constructed channels that are cut down a slope.

7. Protect Drain Inlets

a. Protect all storm drain inlets made operable during construction so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.

b. Clean or remove and replace inlet protection devices when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

8. Stabilize Channels and Outlets

a. Design, construct and stabilize all on-site conveyance channels to prevent erosion from the following expected peak flows:

i. West of the Cascade Mountains Crest: Channels must handle the peak 10-minute velocity of flow from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate indicated by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the WWHM to predict flows, bare soil areas should be modeled as "landscaped area."

ii. East of the Cascade Mountains Crest: Channels must handle the expected peak flow velocity from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.

b. Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches at the outlets of all conveyance systems.

9. Control Pollutants

Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants. The Permittee must:

a. Handle and dispose of all pollutants, including waste materials and demolition debris that occur on site in a manner that does not cause contamination of stormwater.

b. Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. On-site fueling tanks must include secondary containment. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume contained in the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment.

c. Conduct maintenance, fueling, and repair of heavy equipment and vehicles using spill prevention and control measures. Clean contaminated surfaces immediately following any spill incident.

d. Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland land application, or to the sanitary sewer with local sewer district approval.

e. Apply fertilizers and pesticides in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers' label requirements for application rates and procedures.

f. Use BMPs to prevent contamination of stormwater runoff by pH-modifying sources. The sources for this contamination include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout waters. (Also refer to the definition for "concrete wastewater" in Appendix A--Definitions.)

g. Adjust the pH of stormwater if necessary to prevent violations of water quality standards.

h. Assure that washout of concrete trucks is performed offsite or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Do not dump excess concrete on site, except in designated concrete washout areas. Concrete spillage or concrete discharge to surface waters of the State is prohibited.

i. Obtain written approval from Ecology before using chemical treatment other than CO_2 or dry ice to adjust pH.

10. Control Dewatering

a. Permittees must discharge foundation, vault, and trench dewatering water, which have characteristics similar to stormwater runoff at the site, into a

controlled conveyance system before discharge to a sediment trap or sediment pond.

b. Permittees may discharge clean, non-turbid dewatering water, such as well-point ground water, to systems tributary to, or directly into surface waters of the State, as specified in Special Condition S9.D.8, provided the dewatering flow does not cause erosion or flooding of receiving waters. Do not route clean dewatering water through stormwater sediment ponds. Note that "surface waters of the State" may exist on a construction site as well as off site; for example, a creek running through a site.

c. Other treatment or disposal options may include:

   i. Infiltration.

   ii. Transport off site in a vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters.

   iii. Ecology-approved on-site chemical treatment or other suitable treatment technologies.

   iv. Sanitary or combined sewer discharge with local sewer district approval, if there is no other option.

   v. Use of a sedimentation bag with discharge to a ditch or swale for small volumes of localized dewatering.

d. Permittees must handle highly turbid or contaminated dewatering water separately from stormwater.

11. Maintain BMPs

    a. Permittees must maintain and repair all temporary and permanent erosion and sediment control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.

    b. Permittees must remove all temporary erosion and sediment control BMPs within 30 days after achieving final site stabilization or after the temporary BMPs are no longer needed.

12. Manage the Project

    a. Phase development projects to the maximum degree practicable and take into account seasonal work limitations.

    b. Inspection and monitoring -- Inspect, maintain and repair all BMPs as needed to assure continued performance of their intended function. Conduct site inspections and monitoring in accordance with Special Condition S4.

    c. Maintaining an updated construction SWPPP -- Maintain, update, and implement the SWPPP in accordance with Special Conditions S3, S4 and S9.

E. SWPPP – Map Contents and Requirements

The Permittee's SWPPP must also include a vicinity map or general location map (for example, a USGS quadrangle map, a portion of a county or city map, or other appropriate map) with enough detail to identify the location of the construction site and receiving waters within one mile of the site.

The SWPPP must also include a legible site map (or maps) showing the entire construction site. The following features must be identified, unless not applicable due to site conditions:

1. The direction of north, property lines, and existing structures and roads.
2. Cut and fill slopes indicating the top and bottom of slope catch lines.
3. Approximate slopes, contours, and direction of stormwater flow before and after major grading activities.
4. Areas of soil disturbance and areas that will not be disturbed.
5. Locations of structural and nonstructural controls (BMPs) identified in the SWPPP.
6. Locations of off-site material, stockpiles, waste storage, borrow areas, and vehicle/equipment storage areas.
7. Locations of all surface water bodies, including wetlands.
8. Locations where stormwater or non-stormwater discharges off-site and/or to a surface water body, including wetlands.
9. Location of water quality sampling station(s), if sampling is required by state or local permitting authority.
10. Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.

S10. NOTICE OF TERMINATION

A. The site is eligible for termination of coverage when it has met any of the following conditions:

1. The site has undergone final stabilization, the Permittee has removed all temporary BMPs (except biodegradable BMPs clearly manufactured with the intention for the material to be left in place and not interfere with maintenance or land use), and all stormwater discharges associated with construction activity have been eliminated; or
2. All portions of the site that have not undergone final stabilization per Special Condition S10.A.1 have been sold and/or transferred (per General Condition G9), and the Permittee no longer has operational control of the construction activity; or

3. For residential construction only, the Permittee has completed temporary stabilization and the homeowners have taken possession of the residences.

B. When the site is eligible for termination, the Permittee must submit a complete and accurate Notice of Termination (NOT) form, signed in accordance with General Condition G2, to:

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, Washington 98504-7696

The termination is effective on the date Ecology receives the NOT form, unless Ecology notifies the Permittee within 30 days that termination request is denied because the Permittee has not met the eligibility requirements in Special Condition S10.A.

Permittees transferring the property to a new property owner or operator/permittee are required to complete and submit the Notice of Transfer form to Ecology, but are not required to submit a Notice of Termination form for this type of transaction.

GENERAL CONDITIONS

G1. DISCHARGE VIOLATIONS

All discharges and activities authorized by this general permit must be consistent with the terms and conditions of this general permit. Any discharge of any pollutant more frequent than or at a level in excess of that identified and authorized by the general permit must constitute a violation of the terms and conditions of this permit.

G2. SIGNATORY REQUIREMENTS

A. All permit applications must bear a certification of correctness to be signed:

1. In the case of corporations, by a responsible corporate officer of at least the level of vice president of a corporation;

2. In the case of a partnership, by a general partner of a partnership;

3. In the case of sole proprietorship, by the proprietor; or

4. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

B. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to the Ecology.

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

C. Changes to authorization. If an authorization under paragraph G2.B.2 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph G2.B.2 above must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a document under this section must make the following certification:

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering

information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G3. RIGHT OF INSPECTION AND ENTRY

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

A. To enter upon the premises where a discharge is located or where any records are kept under the terms and conditions of this permit.

B. To have access to and copy – at reasonable times and at reasonable cost -- any records required to be kept under the terms and conditions of this permit.

C. To inspect -- at reasonable times – any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.

D. To sample or monitor – at reasonable times – any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G4. GENERAL PERMIT MODIFICATION AND REVOCATION

This permit may be modified, revoked and reissued, or terminated in accordance with the provisions of Chapter 173-226 WAC. Grounds for modification, revocation and reissuance, or termination include, but are not limited to, the following:

A. When a change occurs in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this permit.

B. When effluent limitation guidelines or standards are promulgated pursuant to the CWA or Chapter 90.48 RCW, for the category of dischargers covered under this permit.

C. When a water quality management plan containing requirements applicable to the category of dischargers covered under this permit is approved, or

D. When information is obtained that indicates cumulative effects on the environment from dischargers covered under this permit are unacceptable.

G5. REVOCATION OF COVERAGE UNDER THE PERMIT

Pursuant to Chapter 43.21B RCW and Chapter 173-226 WAC, the Director may terminate coverage for any discharger under this permit for cause. Cases where coverage may be terminated include, but are not limited to, the following:

A. Violation of any term or condition of this permit.

B. Obtaining coverage under this permit by misrepresentation or failure to disclose fully all relevant facts.

C. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

D. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.

E. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations.

F. Nonpayment of permit fees or penalties assessed pursuant to RCW 90.48.465 and Chapter 173-224 WAC.

G. Failure of the Permittee to satisfy the public notice requirements of WAC 173-226-130(5), when applicable.

The Director may require any discharger under this permit to apply for and obtain coverage under an individual permit or another more specific general permit. Permittees who have their coverage revoked for cause according to WAC 173-226-240 may request temporary coverage under this permit during the time an individual permit is being developed, provided the request is made within ninety (90) days from the time of revocation and is submitted along with a complete individual permit application form.

G6. REPORTING A CAUSE FOR MODIFICATION

The Permittee must submit a new application, or a supplement to the previous application, whenever a material change to the construction activity or in the quantity or type of discharge is anticipated which is not specifically authorized by this permit. This application must be submitted at least sixty (60) days prior to any proposed changes. Filing a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.

G7. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit will be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G8. DUTY TO REAPPLY

The Permittee must apply for permit renewal at least 180 days prior to the specified expiration date of this permit.

G9. TRANSFER OF GENERAL PERMIT COVERAGE

Coverage under this general permit is automatically transferred to a new discharger, including operators of lots/parcels within a common plan of development or sale, **if**:

A. A written agreement (Transfer of Coverage Form) between the current discharger (Permittee) and new discharger, signed by both parties and containing a specific date for transfer of permit responsibility, coverage, and liability is submitted to the Director; and

B. The Director does not notify the current discharger and new discharger of the Director's intent to revoke coverage under the general permit. If this notice is not given, the transfer is effective on the date specified in the written agreement.

When a current discharger (Permittee) transfers a portion of a permitted site, the current discharger must also submit an updated application form (NOI) to the Director indicating the remaining permitted acreage after the transfer.

G10. REMOVED SUBSTANCES

The Permittee must not re-suspend or reintroduce collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of stormwater to the final effluent stream for discharge to state waters.

G11. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology, within a reasonable time, all information that Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology, upon request, copies of records required to be kept by this permit [40 CFR 122.41(h)].

G12. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G13. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G14. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit shall be deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to ten thousand dollars ($10,000) and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit shall incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars ($10,000) for every such violation. Each and every such violation shall be a separate and distinct offense, and in case of a continuing violation, every day's continuance shall be deemed to be a separate and distinct violation.

G15. UPSET

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that: 1) an upset occurred and that the Permittee can identify the cause(s) of the upset; 2) the permitted facility was being properly operated at the time of the upset; 3) the Permittee submitted notice of the upset as required in Special Condition S5.F, and; 4) the Permittee complied with any remedial measures required under this permit.

In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. DUTY TO COMPLY

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G18. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment shall be a fine of not more than $20,000 per day of violation, or imprisonment of not more than four (4) years, or both.

G20. REPORTING PLANNED CHANGES

The Permittee must, as soon as possible, give notice to Ecology of planned physical alterations, modifications or additions to the permitted construction activity. The Permittee should be aware that, depending on the nature and size of the changes to the original permit, a new public notice and other permit process requirements may be required. Changes in activities that require reporting to Ecology include those that will result in:

A. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).

B. A significant change in the nature or an increase in quantity of pollutants discharged, including but not limited to: for sites 5 acres or larger, a 20% or greater increase in acreage disturbed by construction activity.

C. A change in or addition of surface water(s) receiving stormwater or non-stormwater from the construction activity.

D. A change in the construction plans and/or activity that affects the Permittee's monitoring requirements in Special Condition S4.

Following such notice, permit coverage may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G21. REPORTING OTHER INFORMATION

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to Ecology, it must promptly submit such facts or information.

G22. REPORTING ANTICIPATED NON-COMPLIANCE

The Permittee must give advance notice to Ecology by submission of a new application or supplement thereto at least forty-five (45) days prior to commencement of such discharges, of any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility or activity which may result in noncompliance with permit limits or conditions. Any maintenance of facilities, which might necessitate unavoidable interruption of operation and degradation of effluent quality, must be scheduled during non-critical water quality periods and carried out in a manner approved by Ecology.

G23. REQUESTS TO BE EXCLUDED FROM COVERAGE UNDER THE PERMIT

Any discharger authorized by this permit may request to be excluded from coverage under the general permit by applying for an individual permit. The discharger must submit to the Director an application as described in WAC 173-220-040 or WAC 173-216-070, whichever is applicable, with reasons supporting the request. These reasons will fully document how an individual permit will apply to the applicant in a way that the general permit cannot. Ecology may make specific requests for information to support the request. The Director will either issue an individual permit or deny the request with a statement explaining the reason for the denial. When an individual permit is issued to a discharger otherwise subject to the construction stormwater general permit, the applicability of the construction stormwater general permit to that Permittee is automatically terminated on the effective date of the individual permit.

G24. APPEALS

A. The terms and conditions of this general permit, as they apply to the appropriate class of dischargers, are subject to appeal by any person within 30 days of issuance of this general permit, in accordance with Chapter 43.21B RCW, and Chapter 173-226 WAC.

B. The terms and conditions of this general permit, as they apply to an individual discharger, are appealable in accordance with Chapter 43.21B RCW within 30 days of the effective date of coverage of that discharger. Consideration of an appeal of general permit coverage of an individual discharger is limited to the general permit's applicability or nonapplicability to that individual discharger.

C. The appeal of general permit coverage of an individual discharger does not affect any other dischargers covered under this general permit. If the terms and conditions of this general permit are found to be inapplicable to any individual discharger(s), the matter

shall be remanded to Ecology for consideration of issuance of an individual permit or permits.

G25. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

G26. BYPASS PROHIBITED

A. Bypass Procedures

Bypass, which is the intentional diversion of waste streams from any portion of a treatment facility, is prohibited for stormwater events below the design criteria for stormwater management. Ecology may take enforcement action against a Permittee for bypass unless one of the following circumstances (1, 2, 3 or 4) is applicable.

1. Bypass of stormwater is consistent with the design criteria and part of an approved management practice in the applicable stormwater management manual.

2. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

   Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limitations or other conditions of this permit, or adversely impact public health.

3. Bypass of stormwater is unavoidable, unanticipated, and results in noncompliance of this permit.

   This bypass is permitted only if:

   a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.

   b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility.

c. Ecology is properly notified of the bypass as required in Special Condition S5.F of this permit.

4. A planned action that would cause bypass of stormwater and has the potential to result in noncompliance of this permit during a storm event.

   The Permittee must notify Ecology at least thirty (30) days before the planned date of bypass. The notice must contain:

   a. a description of the bypass and its cause

   b. an analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing.

   c. a cost-effectiveness analysis of alternatives including comparative resource damage assessment.

   d. the minimum and maximum duration of bypass under each alternative.

   e. a recommendation as to the preferred alternative for conducting the bypass.

   f. the projected date of bypass initiation.

   g. a statement of compliance with SEPA.

   h. a request for modification of water quality standards as provided for in WAC 173-201A-110, if an exceedance of any water quality standard is anticipated.

   i. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

5. For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. The analysis required above must be considered during preparation of the Stormwater Pollution Prevention Plan (SWPPP) and must be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass.

   Ecology will consider the following before issuing an administrative order for this type bypass:

   a. If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.

   b. If there are feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.

   c. If the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve, conditionally approve, or deny the request. The public must be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by Ecology under RCW 90.48.120.

B. Duty to Mitigate

The Permittee is required to take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

APPENDIX A – DEFINITIONS

AKART is an acronym for "all known, available, and reasonable methods of prevention, control, and treatment." AKART represents the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants and controlling pollution associated with a discharge.

Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which was completed and approved by EPA before January 1, 2011, or before the date the operator's complete permit application is received by Ecology, whichever is later.

Applicant means an operator seeking coverage under this permit.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: stormwater associated with construction activity, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Buffer means an area designated by a local jurisdiction that is contiguous to and intended to protect a sensitive area.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

Calendar Day A period of 24 consecutive hours starting at 12:00 midnight and ending the following 12:00 midnight.

Calendar Week (same as Week) means a period of seven consecutive days starting at 12:01 a.m. (0:01 hours) on Sunday.

Certified Erosion and Sediment Control Lead (CESCL) means a person who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (see BMP C160 in the SWMM).

Clean Water Act (CWA) means the Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, and 97-117; USC 1251 et seq.

Combined Sewer means a sewer which has been designed to serve as a sanitary sewer and a storm sewer, and into which inflow is allowed by local ordinance.

Common Plan of Development or Sale means a site where multiple separate and distinct construction activities may be taking place at different times on different schedules and/or by different contractors, but still under a single plan. Examples include: 1) phased projects and projects with multiple filings or lots, even if the separate phases or filings/lots will be constructed under separate contract or by separate owners (e.g., a development where lots are sold to separate builders); 2) a development plan that may be phased over multiple years, but is still under a

consistent plan for long-term development; 3) projects in a contiguous area that may be unrelated but still under the same contract, such as construction of a building extension and a new parking lot at the same facility; and 4) linear projects such as roads, pipelines, or utilities. If the project is part of a common plan of development or sale, the disturbed area of the entire plan must be used in determining permit requirements.

Composite Sample means a mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increases while maintaining a constant time interval between the aliquots.

Concrete wastewater means any water used in the production, pouring and/or clean-up of concrete or concrete products, and any water used to cut, grind, wash, or otherwise modify concrete or concrete products. Examples include water used for or resulting from concrete truck/mixer/pumper/tool/chute rinsing or washing, concrete saw cutting and surfacing (sawing, coring, grinding, roughening, hydro-demolition, bridge and road surfacing). When stormwater comingles with concrete wastewater, the resulting water is considered concrete wastewater and must be managed to prevent discharge to waters of the state, including ground water.

Construction Activity means land disturbing operations including clearing, grading or excavation which disturbs the surface of the land. Such activities may include road construction, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Contaminant means any hazardous substance that does not occur naturally or occurs at greater than natural background levels. See definition of "hazardous substance" and WAC 173-340-200.

Demonstrably Equivalent means that the technical basis for the selection of all stormwater BMPs is documented within a SWPPP, including:

1. The method and reasons for choosing the stormwater BMPs selected.
2. The pollutant removal performance expected from the BMPs selected.
3. The technical basis supporting the performance claims for the BMPs selected, including any available data concerning field performance of the BMPs selected.
4. An assessment of how the selected BMPs will comply with state water quality standards.
5. An assessment of how the selected BMPs will satisfy both applicable federal technology-based treatment requirements and state requirements to use all known, available, and reasonable methods of prevention, control, and treatment (AKART).

Department means the Washington State Department of Ecology.

Detention means the temporary storage of stormwater to improve quality and/or to reduce the mass flow rate of discharge.

Dewatering means the act of pumping ground water or stormwater away from an active construction site.

Director means the Director of the Washington Department of Ecology or his/her authorized representative.

Discharger means an owner or operator of any facility or activity subject to regulation under Chapter 90.48 RCW or the Federal Clean Water Act.

Domestic Wastewater means water carrying human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments, or other places, together with such ground water infiltration or surface waters as may be present.

Ecology means the Washington State Department of Ecology.

Engineered Soils means the use of soil amendments including, but not limited, to Portland cement treated base (CTB), cement kiln dust (CKD), or fly ash to achieve certain desirable soil characteristics.

Equivalent BMPs means operational, source control, treatment, or innovative BMPs which result in equal or better quality of stormwater discharge to surface water or to ground water than BMPs selected from the SWMM.

Erosion means the wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep.

Erosion and Sediment Control BMPs means BMPs intended to prevent erosion and sedimentation, such as preserving natural vegetation, seeding, mulching and matting, plastic covering, filter fences, sediment traps, and ponds. Erosion and sediment control BMPs are synonymous with stabilization and structural BMPs.

Final Stabilization (same as fully stabilized or full stabilization) means the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as riprap, gabions or geotextiles) which prevents erosion.

Ground Water means water in a saturated zone or stratum beneath the land surface or a surface water body.

Hazardous Substance means any dangerous or extremely hazardous waste as defined in RCW 70.105.010 (5) and (6), or any dangerous or extremely dangerous waste as designated by rule under chapter 70.105 RCW; any hazardous sub-stance as defined in RCW 70.105.010(14) or any hazardous substance as defined by rule under chapter 70.105 RCW; any substance that, on the effective date of this section, is a hazardous substance under section 101(14) of the federal cleanup law, 42 U.S.C., Sec. 9601(14); petroleum or petroleum products; and any substance or category of substances, including solid waste decomposition products, determined by the director

by rule to present a threat to human health or the environment if released into the environment. The term hazardous substance does not include any of the following when contained in an underground storage tank from which there is not a release: crude oil or any fraction thereof or petroleum, if the tank is in compliance with all applicable federal, state, and local law.

Injection Well means a well that is used for the subsurface emplacement of fluids. (See Well.)

Jurisdiction means a political unit such as a city, town or county; incorporated for local self-government.

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the State from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington Department of Ecology.

Notice of Intent (NOI) means the application for, or a request for coverage under this general permit pursuant to WAC 173-226-200.

Notice of Termination (NOT) means a request for termination of coverage under this general permit as specified by Special Condition S10 of this permit.

Operator means any party associated with a construction project that meets either of the following two criteria:

- The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

Permittee means individual or entity that receives notice of coverage under this general permit.

pH means a liquid's measure of acidity or alkalinity. A pH of 7 is defined as neutral. Large variations above or below this value are considered harmful to most aquatic life.

pH monitoring period means the time period in which the pH of stormwater runoff from a site must be tested a minimum of once every seven days to determine if stormwater pH is between 6.5 and 8.5.

Point source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, and container from which pollutants are or may be discharged to surface waters of the State. This term does not include return flows from irrigated agriculture. (See Fact Sheet for further explanation.)

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, domestic sewage sludge (biosolids), munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste. This term does not include sewage from vessels within the meaning of section 312 of the CWA, nor does it include dredged or fill material discharged in accordance with a permit issued under section 404 of the CWA.

Pollution means contamination or other alteration of the physical, chemical, or biological properties of waters of the State; including change in temperature, taste, color, turbidity, or odor of the waters; or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the State as will or is likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety or welfare; or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or to livestock, wild animals, birds, fish or other aquatic life.

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product (40 CFR 122.1).

Receiving water means the water body at the point of discharge. If the discharge is to a storm sewer system, either surface or subsurface, the receiving water is the water body to which the storm system discharges. Systems designed primarily for other purposes such as for ground water drainage, redirecting stream natural flows, or for conveyance of irrigation water/return flows that coincidentally convey stormwater are considered the receiving water.

Representative means a stormwater or wastewater sample which represents the flow and characteristics of the discharge. Representative samples may be a grab sample, a time-proportionate composite sample, or a flow proportionate sample. Ecology's Construction Stormwater Monitoring Manual provides guidance on representative sampling.

Sanitary sewer means a sewer which is designed to convey domestic wastewater.

Sediment means the fragmented material that originates from the weathering and erosion of rocks or unconsolidated deposits, and is transported by, suspended in, or deposited by water.

Sedimentation means the depositing or formation of sediment.

Sensitive area means a water body, wetland, stream, aquifer recharge area, or channel migration zone.

SEPA (State Environmental Policy Act) means the Washington State Law, RCW 43.21C.020, intended to prevent or eliminate damage to the environment.

Significant Amount means an amount of a pollutant in a discharge that is amenable to available and reasonable methods of prevention or treatment; or an amount of a pollutant that has a

reasonable potential to cause a violation of surface or ground water quality or sediment management standards.

Significant concrete work means greater than 1000 cubic yards poured concrete or recycled concrete over the life of a project.

Significant Contributor of Pollutants means a facility determined by Ecology to be a contributor of a significant amount(s) of a pollutant(s) to waters of the State of Washington.

Site means the land or water area where any "facility or activity" is physically located or conducted.

Source control BMPs means physical, structural or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater. A few examples of source control BMPs are erosion control practices, maintenance of stormwater facilities, constructing roofs over storage and working areas, and directing wash water and similar discharges to the sanitary sewer or a dead end sump.

Stabilization means the application of appropriate BMPs to prevent the erosion of soils, such as, temporary and permanent seeding, vegetative covers, mulching and matting, plastic covering and sodding. See also the definition of Erosion and Sediment Control BMPs.

Storm drain means any drain which drains directly into a storm sewer system, usually found along roadways or in parking lots.

Storm sewer system means a means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains designed or used for collecting or conveying stormwater. This does not include systems which are part of a combined sewer or Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Stormwater means that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Stormwater Management Manual (SWMM) or Manual means the technical Manual published by Ecology for use by local governments that contain descriptions of and design criteria for BMPs to prevent, control, or treat pollutants in stormwater.

Stormwater Pollution Prevention Plan (SWPPP) means a documented plan to implement measures to identify, prevent, and control the contamination of point source discharges of stormwater.

Surface Waters of the State includes lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Temporary Stabilization means the exposed ground surface has been covered with appropriate materials to provide temporary stabilization of the surface from water or wind erosion. Materials include, but are not limited to, mulch, riprap, erosion control mats or blankets and temporary cover crops. Seeding alone is not considered stabilization. Temporary stabilization is not a substitute for the more permanent "final stabilization."

Total Maximum Daily Load (TMDL) means a calculation of the maximum amount of a pollutant that a water body can receive and still meet state water quality standards. Percentages of the total maximum daily load are allocated to the various pollutant sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The TMDL calculations must include a "margin of safety" to ensure that the water body can be protected in case there are unforeseen events or unknown sources of the pollutant. The calculation must also account for seasonable variation in water quality.

Treatment BMPs means BMPs that are intended to remove pollutants from stormwater. A few examples of treatment BMPs are detention ponds, oil/water separators, biofiltration, and constructed wetlands.

Transparency means a measurement of water clarity in centimeters (cm), using a 60 cm transparency tube. The transparency tube is used to estimate the relative clarity or transparency of water by noting the depth at which a black and white Secchi disc becomes visible when water is released from a value in the bottom of the tube. A transparency tube is sometimes referred to as a "turbidity tube."

Turbidity means the clarity of water expressed as nephelometric turbidity units (NTU) and measured with a calibrated turbidimeter.

Uncontaminated means free from any contaminant, as defined in MTCA cleanup regulations. See definition of "contaminant" and WAC 173-340-200.

Waste Load Allocation (WLA) means the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality based effluent limitation (40 CFR 130.2[h]).

Water quality means the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose.

Waters of the State includes those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the State" as defined in Chapter 90.48 RCW, which include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Well means a bored, drilled or driven shaft, or dug hole whose depth is greater than the largest surface dimension. (See Injection well.)

Wheel wash wastewater means any water used in, or resulting from the operation of, a tire bath or wheel wash (BMP C106: Wheel Wash), or other structure or practice that uses water to physically remove mud and debris from vehicles leaving a construction site and prevent track-out onto roads. When stormwater comingles with wheel wash wastewater, the resulting water is considered wheel wash wastewater and must be managed according to Special Condition S9.D.9.

APPENDIX B – ACRONYMS

AKART	All Known, Available, and Reasonable Methods of Prevention, Control, and Treatment
BMP	Best Management Practice
CESCL	Certified Erosion and Sediment Control Lead
CFR	Code of Federal Regulations
CKD	Cement Kiln Dust
cm	Centimeters
CTB	Cement-Treated Base
CWA	Clean Water Act
DMR	Discharge Monitoring Report
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
FR	Federal Register
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SWMM	Stormwater Management Manual
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control
USC	United States Code
USEPA	United States Environmental Protection Agency
WAC	Washington Administrative Code
WQ	Water Quality
WWHM	Western Washington Hydrology Model

What do I need to use the WAWebDMR system?

The WAWebDMR system requires a few common computer components:

- PC or Mac.
- DSL or Broadband Internet connection.
- Web browser (Internet Explorer 7.0 or higher, Chrome, FireFox, etc.).
- Personal e-mail account.
- Printer.

So how do I get started?

Step by step registration instructions, with screen shots, are provided at: www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html

Click on the "How to register for WAWebDMR" link to download the registration instructions.

The steps are summarized here:

1. Sign up for a Secure Access Washington (SAW) account or use an existing SAW account.
2. In SAW, register for a new service: Electronic Discharge Monitoring Reports (WAWebDMR).
3. Define a "role" under your permit.
4. Create an electronic signature account (if required).
5. Fill out the electronic signature agreement (ESA) form, print it, and mail to Ecology (if required).
6. Look for your approval e-mail and follow the instructions contained in it.

Need help?

Please feel free to contact Ecology if you have any questions about WAWebDMR.

For technical assistance and help getting registered, contact the WAWebDMR help staff at:

E-mail: WAWebDMR@ecy.wa.gov
Phone: 1-800-633-6193/Option 3
or 360-407-7097 (Local)

For permit-specific or urgent issues, please contact the one of the Ecology offices below:

Central Regional Office - Yakima
WAWebDMR-CRO@ecy.wa.gov

Eastern Regional Office - Spokane
WAWebDMR-ERO@ecy.wa.gov

Northwest Regional Office - Bellevue
WAWebDMR-NWRO@ecy.wa.gov

Southwest Regional Office - Lacey
WAWebDMR-SWRO@ecy.wa.gov

Major Industrial Unit (Ecology HQ)
WAWebDMR-Industrial@ecy.wa.gov

Stormwater Unit (Ecology HQ)
WAWebDMR-Stormwater@ecy.wa.gov

If you need this document in a version for the visually impaired, call the Water Quality Program at 360-407-6401. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

Electronic Discharge Monitoring Reports (WAWebDMR)



Washington State Department of Ecology

DEPARTMENT OF
ECOLOGY
State of Washington

Publication No. 11-10-013
Rev. 03/2011

What is WAWebDMR?

WAWebDMR is a new approach to submitting your Discharge Monitoring Reports (DMRs) to the Department of Ecology. Unlike the current paper method, this new system is fast, available 24/7 over the Internet, and customized for your facility and permit(s). There is no longer a need to calculate the delay for mailing your paper DMRs. Instead, log onto the Internet, select your permit information, select the begin date, enter your values, and then submit the data. We'll even store your data for you after you submit the DMR, just in case you need to redo or reprint it.

How much does it cost?

There are no fees for registering for and using the WAWebDMR system.

Must all DMR submittals be by WAWebDMR?

The WAWebDMR is voluntary at this time (except for sites covered by the construction stormwater general permit). However, we encourage all facilities to give WAWebDMR a try and find out how easy submitting a DMR can be.

Who can have access & what does that access allow?

There are three different roles to choose from when you sign up for WAWebDMR. They are:

Facility Coordinator – Can assign staff to the signer and preparer roles to work on DMRs, and can sign and prepare DMRs themselves.

Examples: permittee, responsible official, delegated authority (environmental manager).

Facility Signer – Can sign and prepare DMRs, and is usually granted access to WAWebDMR by a Facility Coordinator.

Example: delegated authority (plant supervisor, CESCL).

Facility Preparer – Can prepare DMRs and is granted access to WAWebDMR only by a Facility Coordinator.

Examples: contractors, secretaries, data entry staff.

If I sign DMRs for more than one facility/permit do I need a WAWebDMR account for each?

You can register more than one facility/permit under one account. All we ask is that when you register (as a coordinator or signer), you provide proof that you are responsible for each of your listed facilities/permits.

What sort of proof?

Proof comes in the form of a copy of one of the following:

- A previously submitted DMR.
- A permit's cover sheet.
- A permit's letter of coverage.
- Mail from Ecology that includes both the facility's name and the permit number.
- Signature authority delegation letter signed by the permittee (responsible official).

What do I get out of this?

With this system you will have the following benefits:

- Available 24/7.
- Enter both daily and summarized data together.
- Enter your data over time or all at once.
- No delay between mailing the DMR and Ecology receiving it.
- Fill in the data at one location then inform your supervisor in another location to view and submit the DMR.
- Electronic DMRs are customized for both the facility and the permit, including specific reporting requirements for your permit.
- Person signing DMR gets immediate e-mail confirmation.
- Submitted DMRs can be accessed online for re-printing or re-submitting.
- You can add attachments (lab sheets, etc.) to your DMR submission.
- System tracks by whom and when a DMR was submitted.
- Notifies third party people when you sign your DMR.
- Add monitoring points when you need them (construction stormwater and sand & gravel general permits only).

NOTE: The WebDMR name changed to WAWebDMR on March 30,

- The banner on the main WAWebDMR page has changed
- The web address remains the same

APPENDIX F
Draft Special Authorization Discharge (SAD) Permit Application – City of Tacoma

Tacoma
WASHINGTON USA

Special Approved Discharge
To Sanitary Sewer

An application for Special Approved Discharge (SAD) into Tacoma's municipal sanitary sewer system should be submitted at least 30 days before the proposed discharge date. The Tacoma Municipal Code, Chapter 12.08 regulates special approved discharges to the sanitary sewer. Sanitary sewer discharge limits are listed in 12.08.040.

Required Documents

SAD Application Form and supporting documentation
The completed application form must be accompanied by all supporting documentation, including sample analysis results, site drawings, and so forth.

You may be required to provide sampling analyses for total suspended solids, biological oxygen demand, petroleum hydrocarbons, total metals, or other pollutants. Additional sampling may be required as a condition of your permit.

Hold Harmless Agreement (HHA)
An original HHA must be drafted and signed by the property owner or his designee before an SAD permit will be issued. The *example* Hold Harmless Agreement is provided for information only. It is not a fill-in form.

Fees

An administration fee is due with the SAD application.
For discharges of less than 5,000 gallons, the fee is $200.00.
For 5,000 – 20,000 gallons, the fee is $400.00.
For discharges over 20,000 gallons, the fee is $650.00.

The method you will use to measure the discharge must be described in the application; flow meters should read in cubic feet. Tank volume calculations may be used for batch discharges.

A service charge, based on the volume and strength of the discharge, will be billed. The minimum service charge will be at the Domestic Strength per one hundred cubic feet of water (748 gallons).

Information Contact

If you have questions regarding Special Approvals to Discharge to the Tacoma municipal storm or sanitary sewers contact the Pretreatment Coordinator at (253) 591-5588.

Tacoma
WASHINGTON USA

APPLICATION
FOR
SPECIAL AUTHORIZATION TO DISCHARGE
TO THE CITY OF TACOMA
_____ STORM DRAIN __X__ SANITARY SEWER

A. PROJECT NAME AMERICAN PLATING REMEDIATION PROJECT (2110 EAST D STREET, TACOMA WA)

PROJECT NUMBER TBD

B. APPLICANT(S)

1. Name: SU DOWIE

Company: FOSS WATERWAY DEVELOPMENT AUTHORITY

Address: 535 E. DOCK STREET, #204
TACOMA, WA 98402-4630

Relationship to project: PROPERTY OWNER

Contact Person: SAME AS ABOVE

Business Phone Number: 253-597-8122 e-Mail: SDOWIE@THEAFOSS.COM

Emergency (24 hr) Phone Number: 206-595-7402 (IAIN WINGARD)

2. Name of other Participant/Company: GEOENGINEERS, INC.

Address: 1101 S. FAWCETT AVE, #201
TACOMA, WA 98402

Relationship to project: CONSULTING ENGINEER

Business Phone Number: 253-383-4940

Emergency (24 hr) Phone Number: 206-595-7402 (IAIN WINGARD)

3. Name of property owner: SEE #1

Address: SEE #1

Phone Number: SEE #1

4. Billing Name: TBD

Address: TBD

Acct. No. TBD

5. Proposed Discharge Location (Please provide specific locations and city-assigned numbers if applicable) (1) EAST D STREET / EAST 19TH STREET LIFT STATION (EASEMENT MANHOLE) (2) PORTLAND AVENUE TREATMENT PLANT

C. DESCRIBE THE PROPOSED DISCHARGE.

1. Please provide the following detailed information and attach supporting documents:
   a. Site Diagram
   b. Water Source
   c. Suspected or Known Contaminants
   d. Sampling Methods Used and Analysis Results
      (For discharge to sanitary sewer, sample analysis methods must be listed in 40 CFR Part 136)
   e. Pretreatment Plan and Equipment

A. SITE DIAGRAM: SEE ATTACHED
B. WATER SOURCE(S): GROUNDWATER FROM EXCAVATION DE-WATERING, STORMWATER.
C. KNOWN: CADMIUM, CHROMIUM, HEXAVALENT CHROMIUM, COPPER, CYANIDE, NICKEL; SUSPECTED: PETROLEUM HYDROCARBONS
D. SAMPLING METHODS TO BE USED: EPA 6010-ICP, NWTPH-GX AND NWTPH-DX, COLLECTED FROM CONTAINMENT TANKS OR DISCHARGE PORTS.
E. PRETREATMENT PLAN / EQUIP: SETTLEMENT / CONTAINMENT TANKS, PRE-DISHARGE FILTERING (IF NECESSARY)

* TOTAL SUSPENDED SOLIDS (TSS) MAY BE ADDED TO SAMPLE METHODS (D.)

2. Expected Volume (gal): A MINIMUM OF 20,000 GALS.

3. Method of Discharge (gravity, pump, etc.): WATER TRUCK / PUMP

4. Method of Discharge Measurement and location of meter, if applicable: (For discharge to sanitary sewer, meters must read in cubic ft. For discharges to storm drain, meters must read in gallons. Tank volume calculations may be used for batch discharges.) WATER WILL MOST LIKELY BE COLLECTED INTO CONTAINMENT TANKS, BATCH SAMPLED, TREATED IF NECESSARY, TRANSFERED TO WATER TRUCK FOR TRANSPORT TO AUTHORIZED DISCHARGE MANHOLE(S).

5. Flow Rate (gallons per minute): ~25-50 GPM

6. Time and Duration of Discharge (start and end dates, hours of operation):
EST. START DATE: 1ST QTR 2012, EST. END DATE: 2ND QTR 2012, HOURS: 8AM - 5 PM, MONDAY - FRIDAY

D. REQUIRED PERMITS - Specify permit type and number, and effective dates (Ex: City of Tacoma Road Obstruction Permit #1234, effective 2/1 - – 2/15/04):
N/A, PROJECT UNDER A STATE ORDERED CONSENT DECREE

E. OTHER RELEVANT INFORMATION :
N/A

I have personally examined and am familiar with the information submitted in this document and attachments (if applicable). Based upon my inquiry of those individuals immediately responsible for obtaining the information reported herein, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and/or imprisonment.

Date

FOSS WATERWAY DEVELOPMENT AUTHORITY
Name of Applicant/Company

SU DOWIE
Authorized Representative (print)

SU DOWIE
Property Owner (print)

Signature of Authorized Representative

Signature of Property Owner

Other Participant (print)

Signature of Other Participant

Return to:
City of Tacoma
Environmental Services Engineering Division
Compliance Support
2201 Portland Avenue
Tacoma, WA 98421

12.08.040 Limitations on wastewater strength.

A. Maximum Daily Limits. No person shall discharge wastewater into the Municipal Sanitary Sewer System containing a daily maximum concentration greater than:

0.1 mg/l arsenic, total

0.25 mg/l cadmium, total

0.25 mg/l chromium, hexavalent

1.0 mg/l chromium, total

1.0 mg/l copper, total

0.2 mg/l free cyanide

0.64 mg/l total cyanide

0.4 mg/l lead, total

0.05 mg/l mercury, total

1.0 mg/l molybdenum, total

1.0 mg/l nickel, total

0.1 mg/l selenium, total

0.2 mg/l silver, total

2.0 mg/l zinc, total

50 mg/l petroleum hydrocarbons (silica gel treated-hexane extractable material, SGT-HEM)

The above limits apply at the point where the wastewater is discharged to the Municipal Sanitary Sewer System (end of pipe). All concentrations for metallic substances are for "total" metal unless otherwise indicated. Where a user is subject to a National Categorical Pretreatment Standard and a local limit for a given pollutant, the more stringent limit or applicable National Pretreatment Standard shall apply. The daily maximum is defined as the arithmetic mean of the pollutant concentration calculated from all measurements taken that day.

B. Alternate Standards. The City reserves the right to establish, by ordinance or in wastewater discharge permits, alternate standards or requirements on discharges to the Municipal Sanitary Sewer System for specific user groups. Such alternate standards or requirements shall be based upon, but not limited to, an analysis of available treatment technology, potential economic impacts, and potential impacts to the POTW.

C. Dilution. No discharger shall increase the use of potable or process water in any way, nor mix separate waste streams for the purpose of diluting a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the standards set forth in this chapter.

D. Maintenance. It shall be the responsibility of the owners of all pretreatment devices, including but not limited to, grease traps, grease interceptors, sand/oil interceptors (oil/water separators), and other approved systems, to properly operate and maintain such systems and devices to prevent interference, excessive discharge, slug load, restricted flow, or pass through of any contaminants discharged to the POTW. Maintenance and disposal records shall be kept on site for inspection by the Director.

1. Proper maintenance of pretreatment devices shall mean, at a minimum:

a. For grease traps: unless otherwise approved by the Director, grease traps must be cleaned when the total accumulation of surface fats/oils/greases (including floating solids) and settled solids reaches 25 percent of the grease traps overall liquid depth.

b. For grease interceptors: unless otherwise approved by the Director, grease interceptors must be cleaned when the total accumulation of surface fats/oils/greases (including floating solids) and settled solids reaches 25 percent of the volume of any chamber of the grease interceptor.

c. For sand/oil interceptors: unless otherwise approved by the Director, the interceptor shall be inspected monthly and cleaned if any of the following conditions are present: (1) sludge accumulation => 20 percent capacity of any chamber, (2) oil accumulation => 2 inches, (3) coalescing media plugged, (4) visible sheen on interceptor discharge or, (5) sample results exceed limits in this section.

d. Other approved devices: maintenance of other pretreatment devices shall be conducted in accordance with the manufacturer's specifications for such device and/or Engineering Report and/or Operation/Maintenance Manual approved by the City's Pretreatment Program staff. (Ord. 27978 Ex. A; passed Apr. 26, 2011: Ord. 27285 § 3; passed Nov. 2, 2004: Ord. 26888 § 1; passed Dec. 4, 2001: Ord. 25587 § 6; passed Sept. 20, 1994: Ord. 24879 § 3; passed May 21, 1991: Ord. 24049 § 1; passed Mar. 29, 1988: Ord. 23240 § 1; passed Aug. 28, 1984)

12.08.050 Limitations on radioactive wastes.

No person shall discharge or cause to be discharged, any radioactive waste into the Municipal Sewer System except when that person is authorized to use those radioactive materials by the State Department of Health or other governmental agency empowered to regulate radioactive materials. (Ord. 27978 Ex. A; passed Apr. 26, 2011: Ord. 23240 § 1; passed Aug. 28, 1984)

HOLD HARMLESS AGREEMENT

In consideration of the CITY OF TACOMA's (herein referred to as TACOMA) consent to discharge [state type of water, i.e. treated groundwater from LUST, etc.], (herein referred to as "the discharge"), from [location of property where water originates] by [name of company] and [name of property owner(s)] to [address of discharge location];

We, [name of responsible company] and [name of property owner(s)] hereby agree to indemnify, defend and save harmless TACOMA, its officers, agents, and officials, against any and all claims and to pay legal costs, fees, and charges in defense thereof for injury to person or property damage, including but not limited to payment of fines, penalties, or other charges which may be imposed against TACOMA for permit or other actual or alleged violations arising out of or in connection with the operation of or the discharge to the TACOMA sanitary sewage system.

[name of responsible company] and [name of property owner(s)] shall not, by this provision, be required to indemnify TACOMA for loss or damages, or costs incurred in defense, which arise out of the negligence of TACOMA.

SIGNED this ___ day of _____, 20__.

By _____[Name of company official/title]___

_____[Name of responsible company]__

SIGNED this ___ day of _____, 20__.

By_____[Name of property owner(s)]_____

_____

Owner of said property

EXAMPLE

STATE OF WASHINGTON)
:ss
County of Pierce)

On this day personally appeared before me [name of responsible company official], to me known to be the individual described in and who executed the foregoing instrument, and acknowledged that ___ signed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal this ___ day of _____, 20___.

_____
NOTARY PUBLIC in and for the
State of Washington, residing at _____
MY COMMISSION EXPIRES:_____

* * * * * * * * * * * * *

STATE OF WASHINGTON)
:ss
County of Pierce)

On this day personally appeared before me [name of property owner(s)], to me known to be the individual described in and who executed the foregoing instrument, and acknowledged that ___ signed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.

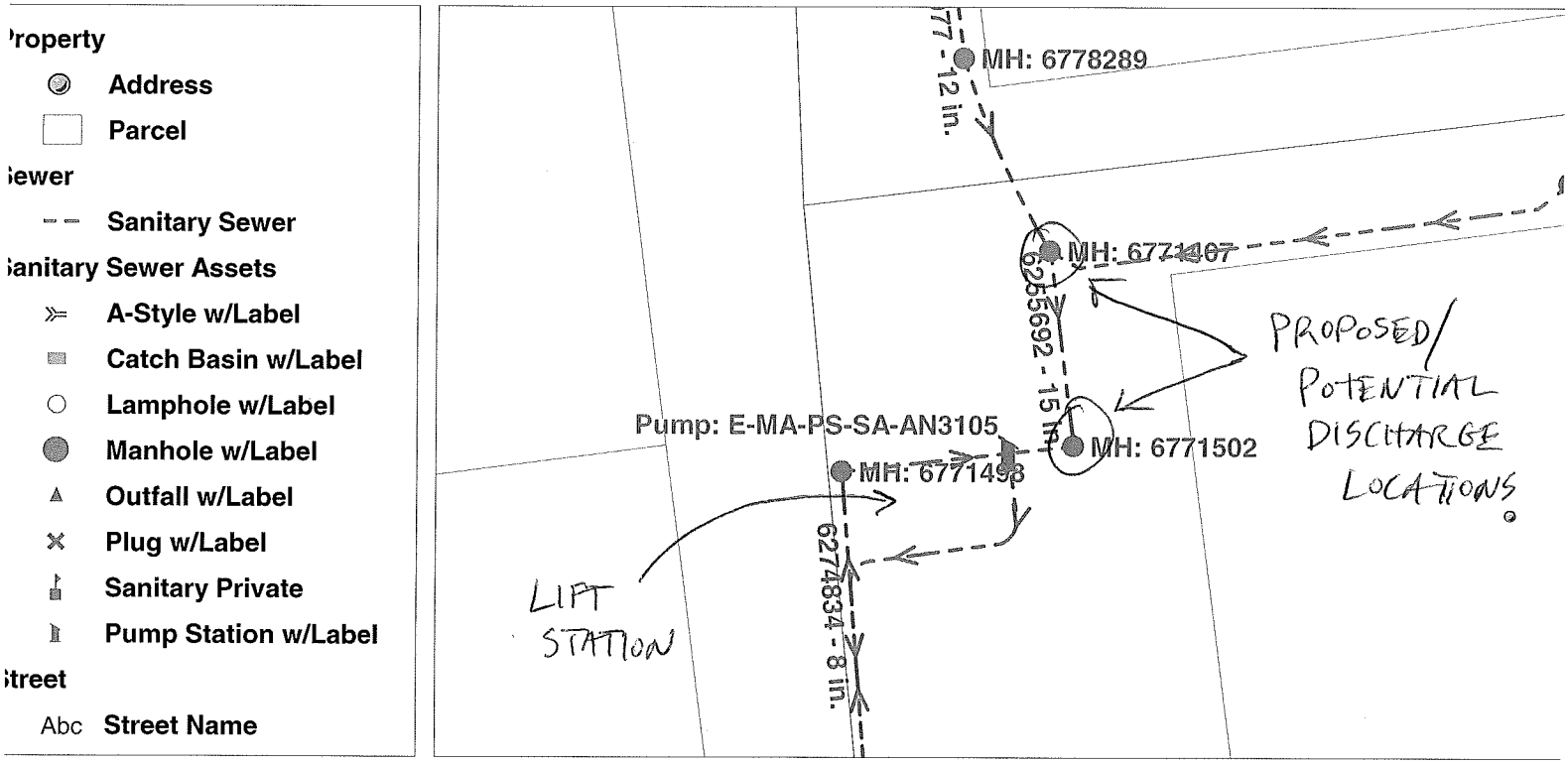
GIVEN under my hand and official seal this _____ day of _____, 20 ____.

_____
NOTARY PUBLIC in and for the State of
Washington, residing at _____
MY COMMISSION EXPIRES:_____
_____

* * * * * * * * * * * * *

City of Tacoma

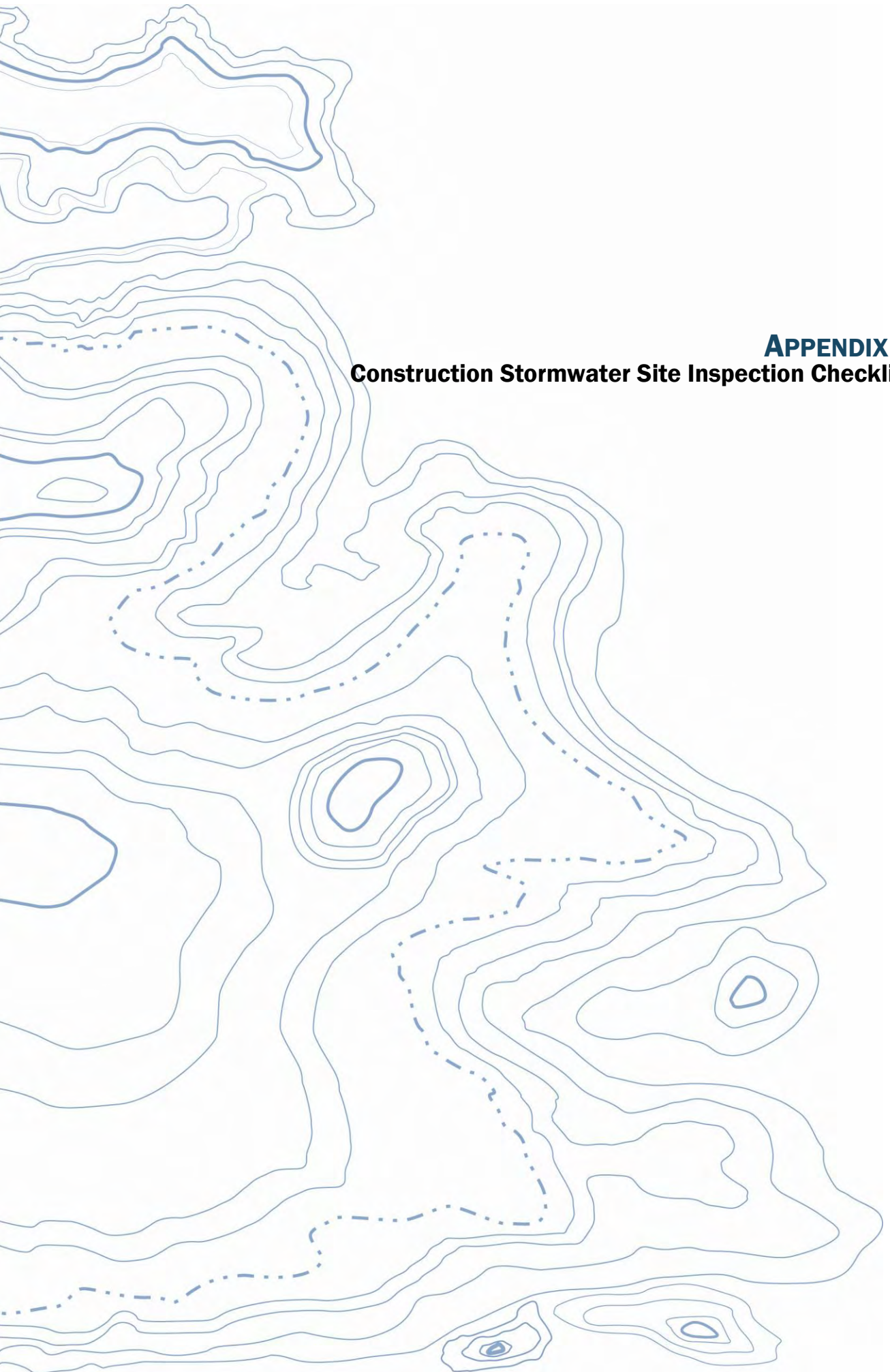
EAST 'D' STREET / EAST 19TH STREET



SCALE 1 : 875

50 0 50 100 150

FEET



APPENDIX G
Construction Stormwater Site Inspection Checklist

Construction Stormwater
SITE INSPECTION CHECKLIST

Project_____ Permit No._____ Inspector_____ Date_____ Time_____

Site BMPs	Overall Condition	Need Repair?	Comments/Observations
Clearing Limits			
•*Buffer Zones around sensitive areas*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Construction Access/Roads			
•*Stabilized site entrance*	G F P	Y N	
•*Stabilized roads/parking area*	G F P	Y N	
•	G F P	Y N	
Control Flow Rates			
•*Swale*	G F P	Y N	
•*Dike*	G F P	Y N	
•*Sediment pond*	G F P	Y N	
•*Sediment trap*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Install Sediment Controls			
•*Sediment pond/trap*	G F P	Y N	
•*Silt fence*	G F P	Y N	
•*Straw bale barriers*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Preserve Vegetation/Stabilize Soils			
•*Nets and blankets*	G F P	Y N	
•*Mulch*	G F P	Y N	
•*Seeding*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Protect Slopes			
•*Terrace*	G F P	Y N	
•*Pipe slope drains*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Protect Drain Inlets			
•*Inserts*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Stabilize Channels and Outlets			
•*Conveyance channels*	G F P	Y N	
•*Energy dissipators*	G F P	Y N	
•	G F P	Y N	
Control Pollutants			
•*Chemical Storage Area covered*	G F P	Y N	
•*Concrete handling*	G F P	Y N	
•	G F P	Y N	
Control De-watering			
•	G F P	Y N	

G=Good F=Fair P=Poor Y=Yes N=No

Excerpt from *How to do Stormwater Monitoring,* Publication # 06-10-020

Construction Stormwater
SITE INSPECTION CHECKLIST

Project_____ Permit No._____ Inspector_____ Date_____ Time_____

Will existing BMPs need to be modified or removed, or other BMPs installed? YES NO
IF YES, list the action items to be completed on the following table:

Actions to be Completed	Date Completed/ Initials
1.	
2.	
3.	
4.	
5.	
6.	

Describe current weather conditions

Approximate amount of precipitation since last inspection: _____ inches
and precipitation in the past 24 hours*: _____inches
**based on an on-site rain gauge or local weather data.*

Describe discharging stormwater, if present. Note the presence of suspended sediment, "cloudiness", discoloration, or oil sheen.

Was water quality sampling part of this inspection? YES NO
If yes, record results below (attach separate sheet, if necessary):

Parameter:	Method (circle one)	Result	Units
Turbidity	tube, meter, laboratory		NTU (cm, if tube used)
pH	paper, kit, meter		pH standard units

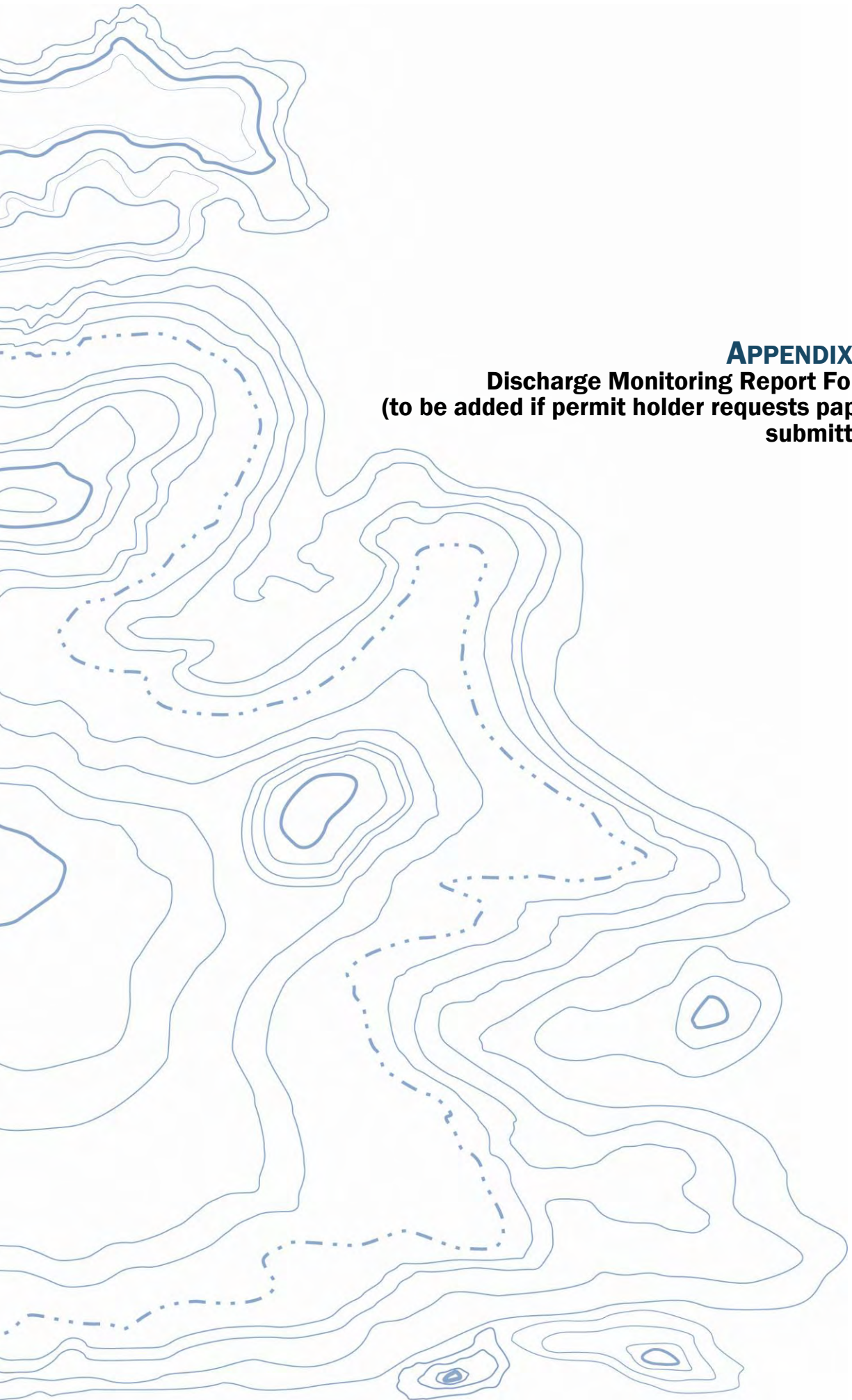
Is the site in compliance with the SWPPP and the permit requirements? YES NO
If no, indicate tasks necessary to bring site into compliance on the "Actions to be Completed" table above, and include dates each job WILL BE COMPLETED.
If no, has the non-compliance been reported to Dept. of Ecology? YES NO
If no, should the SWPPP be modified: YES NO

Sign the following certification:
"I certify that this report is true, accurate, and complete, to the best of my knowledge and belief."

Inspection completed on:_____ by: (print+signature)_____

Title/Qualification of Inspector:_____

Excerpt from *How to do Stormwater Monitoring,* Publication # 06-10-020



APPENDIX H

Discharge Monitoring Report Form (to be added if permit holder requests paper submittal)

DEPARTMENT OF ECOLOGY
State of Washington

Construction Stormwater General Permit WAWebDMR Waiver Request Form

DO NOT ALTER THIS FORM

Permit No. _ _ _ _ _ _ _ _ _

Permittees with coverage under the Construction Stormwater General Permit must use Ecology's on-line reporting program, WAWebDMR, to submit discharge monitoring data electronically (Permit Condition S5.B). Permittees who are unable to submit electronically (for example, those who do not have an internet connection) must submit a waiver request to obtain a paper copy DMR form.

Use this form to request a waiver from the requirement to report stormwater monitoring on-line. If your request is approved, you'll receive a paper discharge monitoring report in the mail within one to two weeks. If your request is denied, you'll receive a letter with our decision.

If you need assistance signing up for WAWebDMR, contact Tonya Wolfe at WAWebDMR@ecy.wa.gov. You can also access a detailed set of instructions at www.ecy.wa.gov/programs/wq/stormwater/index.html under the "WAWebDMRs and PARIS" link, and then select the "More on WAWebDMR" link on the right hand side of the page.

1. Waiver Request Justification

Describe why you're unable to use WAWebDMR to report your stormwater monitoring results.

2. Certification by Permittee

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name	**Company**	**Date**

Signature*	**E-mail Address**

*** Federal regulations require this form to be signed by the following person, or a duly authorized representative:**

A. In the case of corporations, by a principal executive officer of at least the level of vice president.
B. In the case of a partnership, by a general partner of a partnership.
C. In the case of sole proprietorship, by the proprietor.
D. In the case of a municipality, state, federal, or other public facility: by either a principal executive officer or ranking elected official.

A person is a duly authorized representative only if:

A. The authorization is made in writing by a person described above and submitted to the Ecology.
B. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

Please return this signed original document to the address below. Make sure you retain a copy for your records.

Washington Department of Ecology
Water Quality Program – WAWebDMR
PO Box 47696
Olympia, WA 98504-7696

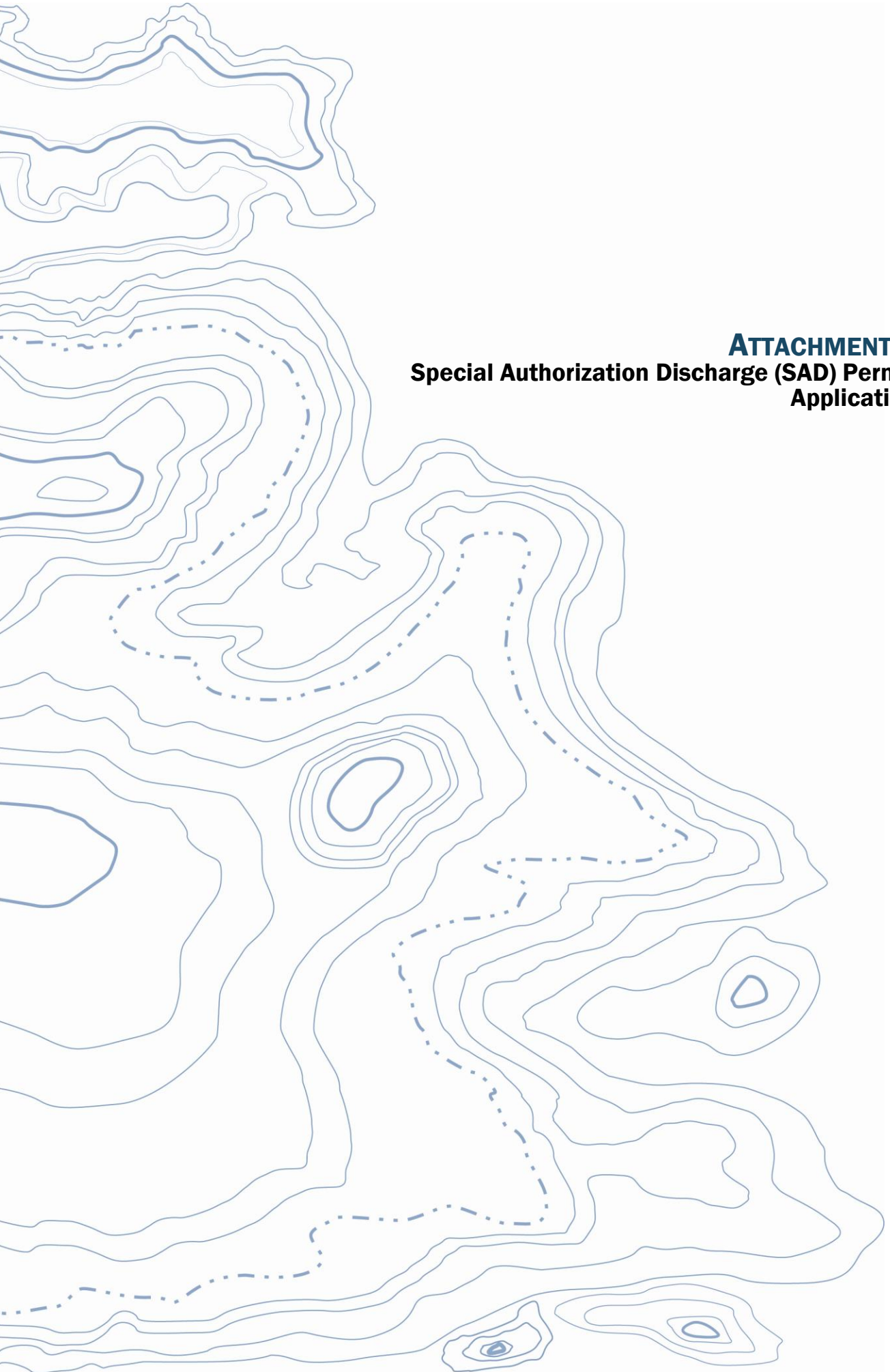
More information is available at: ***http://www.ecy.wa.gov/programs/wq/stormwater/construction/.***

To ask about the availability of this document in a version for the visually impaired call the Water Quality Program at 360-407-6401. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

APPENDIX I
Ecology Correspondence
(to be added as project proceeds)

APPENDIX J

Completed DMRs and Construction Stormwater Site Inspection Checklists
(to be added as project proceeds)



ATTACHMENT 9
Special Authorization Discharge (SAD) Permit Application

Tacoma
WASHINGTON USA

Special Approved Discharge
To Sanitary Sewer

An application for Special Approved Discharge (SAD) into Tacoma's municipal sanitary sewer system should be submitted at least 30 days before the proposed discharge date. The Tacoma Municipal Code, Chapter 12.08 regulates special approved discharges to the sanitary sewer. Sanitary sewer discharge limits are listed in 12.08.040.

Required Documents

SAD Application Form and supporting documentation
The completed application form must be accompanied by all supporting documentation, including sample analysis results, site drawings, and so forth.

You may be required to provide sampling analyses for total suspended solids, biological oxygen demand, petroleum hydrocarbons, total metals, or other pollutants. Additional sampling may be required as a condition of your permit.

Hold Harmless Agreement (HHA)
An original HHA must be drafted and signed by the property owner or his designee before an SAD permit will be issued. The *example* Hold Harmless Agreement is provided for information only. It is not a fill-in form.

Fees

An administration fee is due with the SAD application.
For discharges of less than 5,000 gallons, the fee is $200.00.
For 5,000 – 20,000 gallons, the fee is $400.00.
For discharges over 20,000 gallons, the fee is $650.00.

The method you will use to measure the discharge must be described in the application; flow meters should read in cubic feet. Tank volume calculations may be used for batch discharges.

A service charge, based on the volume and strength of the discharge, will be billed. The minimum service charge will be at the Domestic Strength per one hundred cubic feet of water (748 gallons).

Information Contact

If you have questions regarding Special Approvals to Discharge to the Tacoma municipal storm or sanitary sewers contact the Pretreatment Coordinator at (253) 591-5588.

Tacoma
WASHINGTON USA

APPLICATION
FOR
SPECIAL AUTHORIZATION TO DISCHARGE
TO THE CITY OF TACOMA
_____ STORM DRAIN __X__ SANITARY SEWER

A. PROJECT NAME AMERICAN PLATING REMEDIATION PROJECT (2110 EAST D STREET, TACOMA WA)

PROJECT NUMBER TBD

B. APPLICANT(S)

1. Name: SU DOWIE

Company: FOSS WATERWAY DEVELOPMENT AUTHORITY

Address: 535 E. DOCK STREET, #204
TACOMA, WA 98402-4630

Relationship to project: PROPERTY OWNER

Contact Person: SAME AS ABOVE

Business Phone Number: 253-597-8122 e-Mail: SDOWIE@THEAFOSS.COM

Emergency (24 hr) Phone Number: 206-595-7402 (IAIN WINGARD)

2. Name of other Participant/Company: GEOENGINEERS, INC.

Address: 1101 S. FAWCETT AVE, #201
TACOMA, WA 98402

Relationship to project: CONSULTING ENGINEER

Business Phone Number: 253-383-4940

Emergency (24 hr) Phone Number: 206-595-7402 (IAIN WINGARD)

3. Name of property owner: SEE #1

Address: SEE #1

Phone Number: SEE #1

4. Billing Name: TBD

Address: TBD

Acct. No. TBD

5. Proposed Discharge Location (Please provide specific locations and city-assigned numbers if applicable) (1) EAST D STREET / EAST 19TH STREET LIFT STATION (EASEMENT MANHOLE) (2) PORTLAND AVENUE TREATMENT PLANT

C. DESCRIBE THE PROPOSED DISCHARGE.

1. Please provide the following detailed information and attach supporting documents:
   a. Site Diagram
   b. Water Source
   c. Suspected or Known Contaminants
   d. Sampling Methods Used and Analysis Results
      (For discharge to sanitary sewer, sample analysis methods must be listed in 40 CFR Part 136)
   e. Pretreatment Plan and Equipment

A. SITE DIAGRAM: SEE ATTACHED
B. WATER SOURCE(S): GROUNDWATER FROM EXCAVATION DE-WATERING, STORMWATER.
C. KNOWN: CADMIUM, CHROMIUM, HEXAVALENT CHROMIUM, COPPER, CYANIDE, NICKEL; SUSPECTED: PETROLEUM HYDROCARBONS
D. SAMPLING METHODS TO BE USED: EPA 6010-ICP, NWTPH-GX AND NWTPH-DX, COLLECTED FROM CONTAINMENT TANKS OR DISCHARGE PORTS.
E. PRETREATMENT PLAN / EQUIP: SETTLEMENT / CONTAINMENT TANKS, PRE-DISHARGE FILTERING (IF NECESSARY)

* TOTAL SUSPENDED SOLIDS (TSS) MAY BE ADDED TO SAMPLE METHODS (D.)

2. Expected Volume (gal): A MINIMUM OF 20,000 GALS.

3. Method of Discharge (gravity, pump, etc.): WATER TRUCK / PUMP

4. Method of Discharge Measurement and location of meter, if applicable: (For discharge to sanitary sewer, meters must read in cubic ft. For discharges to storm drain, meters must read in gallons. Tank volume calculations may be used for batch discharges.) WATER WILL MOST LIKELY BE COLLECTED INTO CONTAINMENT TANKS, BATCH SAMPLED, TREATED IF NECESSARY, TRANSFERED TO WATER TRUCK FOR TRANSPORT TO AUTHORIZED DISCHARGE MANHOLE(S).

5. Flow Rate (gallons per minute): ~25-50 GPM

6. Time and Duration of Discharge (start and end dates, hours of operation):
EST. START DATE: 1ST QTR 2012, EST. END DATE: 2ND QTR 2012, HOURS: 8AM - 5 PM, MONDAY - FRIDAY

D. REQUIRED PERMITS - Specify permit type and number, and effective dates (Ex: City of Tacoma Road Obstruction Permit #1234, effective 2/1 - – 2/15/04):
N/A, PROJECT UNDER A STATE ORDERED CONSENT DECREE

E. OTHER RELEVANT INFORMATION :
N/A

I have personally examined and am familiar with the information submitted in this document and attachments (if applicable). Based upon my inquiry of those individuals immediately responsible for obtaining the information reported herein, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and/or imprisonment.

Date

FOSS WATERWAY DEVELOPMENT AUTHORITY
Name of Applicant/Company

SU DOWIE
Authorized Representative (print)

SU DOWIE
Property Owner (print)

Signature of Authorized Representative

Signature of Property Owner

Other Participant (print)

Signature of Other Participant

Return to:
City of Tacoma
Environmental Services Engineering Division
Compliance Support
2201 Portland Avenue
Tacoma, WA 98421

12.08.040 Limitations on wastewater strength.

A. Maximum Daily Limits. No person shall discharge wastewater into the Municipal Sanitary Sewer System containing a daily maximum concentration greater than:

0.1 mg/l arsenic, total

0.25 mg/l cadmium, total

0.25 mg/l chromium, hexavalent

1.0 mg/l chromium, total

1.0 mg/l copper, total

0.2 mg/l free cyanide

0.64 mg/l total cyanide

0.4 mg/l lead, total

0.05 mg/l mercury, total

1.0 mg/l molybdenum, total

1.0 mg/l nickel, total

0.1 mg/l selenium, total

0.2 mg/l silver, total

2.0 mg/l zinc, total

50 mg/l petroleum hydrocarbons (silica gel treated-hexane extractable material, SGT-HEM)

The above limits apply at the point where the wastewater is discharged to the Municipal Sanitary Sewer System (end of pipe). All concentrations for metallic substances are for "total" metal unless otherwise indicated. Where a user is subject to a National Categorical Pretreatment Standard and a local limit for a given pollutant, the more stringent limit or applicable National Pretreatment Standard shall apply. The daily maximum is defined as the arithmetic mean of the pollutant concentration calculated from all measurements taken that day.

B. Alternate Standards. The City reserves the right to establish, by ordinance or in wastewater discharge permits, alternate standards or requirements on discharges to the Municipal Sanitary Sewer System for specific user groups. Such alternate standards or requirements shall be based upon, but not limited to, an analysis of available treatment technology, potential economic impacts, and potential impacts to the POTW.

C. Dilution. No discharger shall increase the use of potable or process water in any way, nor mix separate waste streams for the purpose of diluting a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the standards set forth in this chapter.

D. Maintenance. It shall be the responsibility of the owners of all pretreatment devices, including but not limited to, grease traps, grease interceptors, sand/oil interceptors (oil/water separators), and other approved systems, to properly operate and maintain such systems and devices to prevent interference, excessive discharge, slug load, restricted flow, or pass through of any contaminants discharged to the POTW. Maintenance and disposal records shall be kept on site for inspection by the Director.

1. Proper maintenance of pretreatment devices shall mean, at a minimum:

a. For grease traps: unless otherwise approved by the Director, grease traps must be cleaned when the total accumulation of surface fats/oils/greases (including floating solids) and settled solids reaches 25 percent of the grease traps overall liquid depth.

b. For grease interceptors: unless otherwise approved by the Director, grease interceptors must be cleaned when the total accumulation of surface fats/oils/greases (including floating solids) and settled solids reaches 25 percent of the volume of any chamber of the grease interceptor.

c. For sand/oil interceptors: unless otherwise approved by the Director, the interceptor shall be inspected monthly and cleaned if any of the following conditions are present: (1) sludge accumulation => 20 percent capacity of any chamber, (2) oil accumulation => 2 inches, (3) coalescing media plugged, (4) visible sheen on interceptor discharge or, (5) sample results exceed limits in this section.

d. Other approved devices: maintenance of other pretreatment devices shall be conducted in accordance with the manufacturer's specifications for such device and/or Engineering Report and/or Operation/Maintenance Manual approved by the City's Pretreatment Program staff. (Ord. 27978 Ex. A; passed Apr. 26, 2011: Ord. 27285 § 3; passed Nov. 2, 2004: Ord. 26888 § 1; passed Dec. 4, 2001: Ord. 25587 § 6; passed Sept. 20, 1994: Ord. 24879 § 3; passed May 21, 1991: Ord. 24049 § 1; passed Mar. 29, 1988: Ord. 23240 § 1; passed Aug. 28, 1984)

12.08.050 Limitations on radioactive wastes.

No person shall discharge or cause to be discharged, any radioactive waste into the Municipal Sewer System except when that person is authorized to use those radioactive materials by the State Department of Health or other governmental agency empowered to regulate radioactive materials. (Ord. 27978 Ex. A; passed Apr. 26, 2011: Ord. 23240 § 1; passed Aug. 28, 1984)

HOLD HARMLESS AGREEMENT

In consideration of the CITY OF TACOMA's (herein referred to as TACOMA) consent to discharge [state type of water, i.e. treated groundwater from LUST, etc.], (herein referred to as "the discharge"), from [location of property where water originates] by [name of company] and [name of property owner(s)] to [address of discharge location];

We, [name of responsible company] and [name of property owner(s)] hereby agree to indemnify, defend and save harmless TACOMA, its officers, agents, and officials, against any and all claims and to pay legal costs, fees, and charges in defense thereof for injury to person or property damage, including but not limited to payment of fines, penalties, or other charges which may be imposed against TACOMA for permit or other actual or alleged violations arising out of or in connection with the operation of or the discharge to the TACOMA sanitary sewage system.

[name of responsible company] and [name of property owner(s)] shall not, by this provision, be required to indemnify TACOMA for loss or damages, or costs incurred in defense, which arise out of the negligence of TACOMA.

SIGNED this ___ day of _____, 20__.

By _____[Name of company official/title]___

_____[Name of responsible company]__

SIGNED this ___ day of _____, 20__.

By_____[Name of property owner(s)]_____

_____

Owner of said property

EXAMPLE

STATE OF WASHINGTON)
:ss
County of Pierce)

On this day personally appeared before me [name of responsible company official], to me known to be the individual described in and who executed the foregoing instrument, and acknowledged that ___ signed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal this ___ day of _____, 20___.

_____
NOTARY PUBLIC in and for the
State of Washington, residing at _____
MY COMMISSION EXPIRES:_____

* * * * * * * * * * * * *

STATE OF WASHINGTON)
:ss
County of Pierce)

On this day personally appeared before me [name of property owner(s)], to me known to be the individual described in and who executed the foregoing instrument, and acknowledged that ___ signed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.

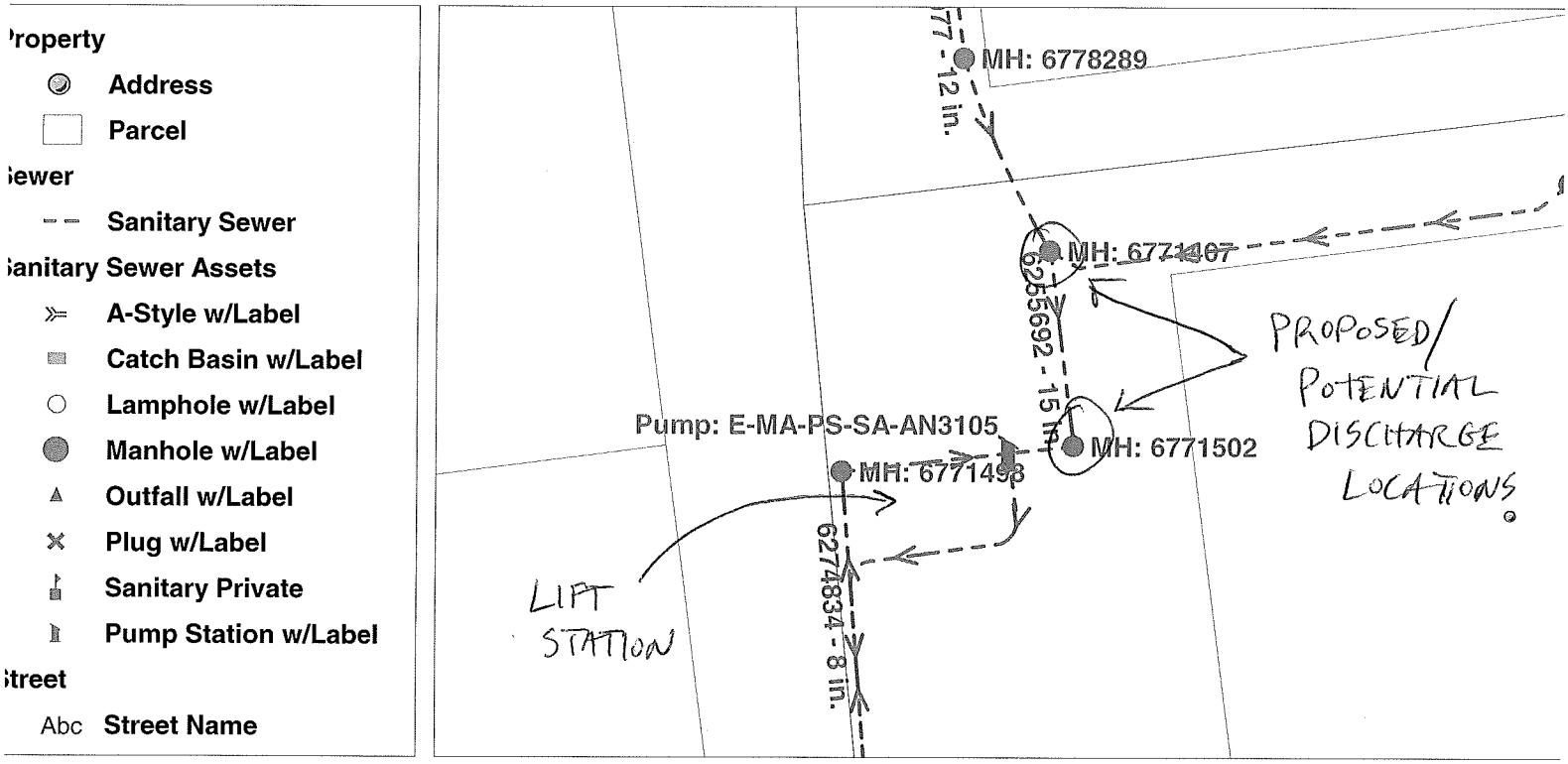
GIVEN under my hand and official seal this _____ day of _____, 20 ____.

_____
NOTARY PUBLIC in and for the State of
Washington, residing at _____
MY COMMISSION EXPIRES:_____
_____

* * * * * * * * * * * * *

City of Tacoma

EAST 'D' STREET / EAST 19TH STREET



SCALE 1 : 875

50 0 50 100 150

FEET

ATTACHMENT 10
Unanticipated Discovery Plan

PLAN AND PROCEDURES FOR THE UNANTICPATED DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS
AMERICAN PLATING SITE
CITY OF TACOMA, PIERCE COUNTY, WASHINGTON

1.0 INTRODUCTION

The Foss Waterway Development Authority (FWDA) plans to complete remedial excavation activities at the American Plating Site, located in Tacoma, WA. The purpose of this project is to remove contaminated soil in accordance with Consent Decree 03 2 14513 6 between FWDA and the Washington Department of Ecology (Ecology). The following Unanticipated Discovery Plan (UDP) outlines procedures to follow, in accordance with state and federal laws, if archaeological materials or human remains are discovered.

2.0 RECOGNIZING CULTURAL RESOURCES

A cultural resource discovery could be prehistoric or historic. Examples include:

- An accumulation of shells, burned rocks, or other food related materials;
- Bones or small pieces of bone;
- An area of charcoal or very dark stained soil with artifacts;
- Stone tools or waste flakes (i.e., an arrowhead or stone chips);
- Clusters of tin cans or bottles, logging or agricultural equipment that appears to be older than 50 years;
- Buried railroad tracks, decking, or other industrial materials.

When in doubt, we will assume the material is a cultural resource.

3.0 ON-SITE RESPONSIBILITIES

3.1 Step 1: Stop Work

If any employee, contractor or subcontractor believes that they have uncovered a cultural resource at any point in the project, all work adjacent to the discovery will stop. The discovery location will be secured at all times.

3.2 Step 2: Notify Project Management

Contact the Project Manager: The Project Manager will make all other calls and notifications. If human remains are encountered, they will be treated with dignity and respect at all times. The remains will be covered with a tarp or other materials (not soil or rocks) for temporary protection in place and to shield them from being photographed. Do not speak with the media.

4.0 FURTHER CONTACTS AND CONSULTATION

4.1 Project Manager's Responsibilities

- Protect Find: The Project Manager is responsible for taking appropriate steps to protect the discovery site. All work will stop in an area adequate to provide for the total security, protection and integrity of the resource. Vehicles, equipment and unauthorized personnel will not be permitted to traverse the discovery site. Work in the immediate area will not resume until treatment of the discovery has been completed following provisions for treating archaeological/ cultural material as set forth in this document.

- Direct construction Elsewhere on Site: The Project Manager may direct construction away from the cultural resources to work in other areas prior to contacting the concerned parties.

- Identify Find: The Project Manager will ensure that a qualified professional archaeologist examines the find to determine if it is archaeological.

- If it is determined not archaeological, work may proceed with no further delay.

- If it is determined to be archaeological, the Project Manager will continue with the notification.

- If the find may be human remains or funerary objects, the Project Manager will ensure that a qualified physical anthropologist examines the find. If it is determined to be human remains, the procedure described in Section 5 will be followed.

- Notify DAHP: The Project Manager will contact the involved federal agencies (if any) and the Department of Archaeology and Historic Preservation (DAHP).
  Dr. Allyson Brooks, State Historic Preservation Officer
  Phone: (360) 586-3066

- Notify Tribes: If the discovery may relate to Native American interests, the Project Manager will also contact the Governor's Office of Indian Affairs (GOIA) and the Puyallup Tribe.
  GOIA
  Mystique Hurtado, Executive Assistant

Phone: (360) 902-8825
Fax: (360) 902-8829
Email: mhurtad@goia.wa.gov

Puyallup Tribe
Thomas Edwards, Tribe Historic Preservationist
Phone: (253) 573-7887

4.2 Further Activities

- Archaeological discoveries will be documented as described in Section 6.
- Construction in the discovery area may resume as described in Section 7.

5.0 SPECIAL PROCEDURES FOR THE DISCOVER OF HUMAN SKELETAL MATERIAL

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect.

FWDA will comply with applicable state and federal laws, and the following procedure:

5.1 Notify Law Enforcement Agency or Coroner's Office

In addition to the actions described in Sections 3 and 4, the Project Manager will immediately notify the local law enforcement agency or coroner's office. The coroner (with assistance of law enforcement personnel) will determine if the remains are human, whether the discovery constitutes a crime scene, and will notify DAHP.

Agency: City of Tacoma Police Department
Phone: (253) 591-5900

5.2 Participate in Consultation

Per Revised Code of Washington RCW 27.53.030, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. Project management personnel will participate in consultation.

5.3 Further Activities

- Documentation of human skeletal remains and funerary object will be agreed upon through the consultation process describe in RCW 27.53.030, RCW 68.50, and RCW 68.60.

- When consultation and documentation activities are complete, construction in the discovery areas may resume as described in Section 7.

6.0 DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological deposits discovered during construction will be assumed eligible for inclusion in the National Register of Historic Places under Criterion D.

Cultural Resources Program staff will ensure the proper documentation and assessment of any discovered cultural resources in cooperation the federal agencies (if any), DAHP, affected tribes, and a contracted consultant (if any).

All prehistoric and historic cultural material discovered during project construction will be recorded by a professional archaeologist on a State of Washington cultural resource site form using standard techniques. Site overviews, features, and artifacts will be photographed; stratigraphic profiles and soil/sediment descriptions will be prepared for subsurface exposures. Discovery location will be documented on scaled site plans and site location maps.

If assessment activity exposes human remains (burials, isolated teeth or bones), the process describe in Section 5 above will be followed.

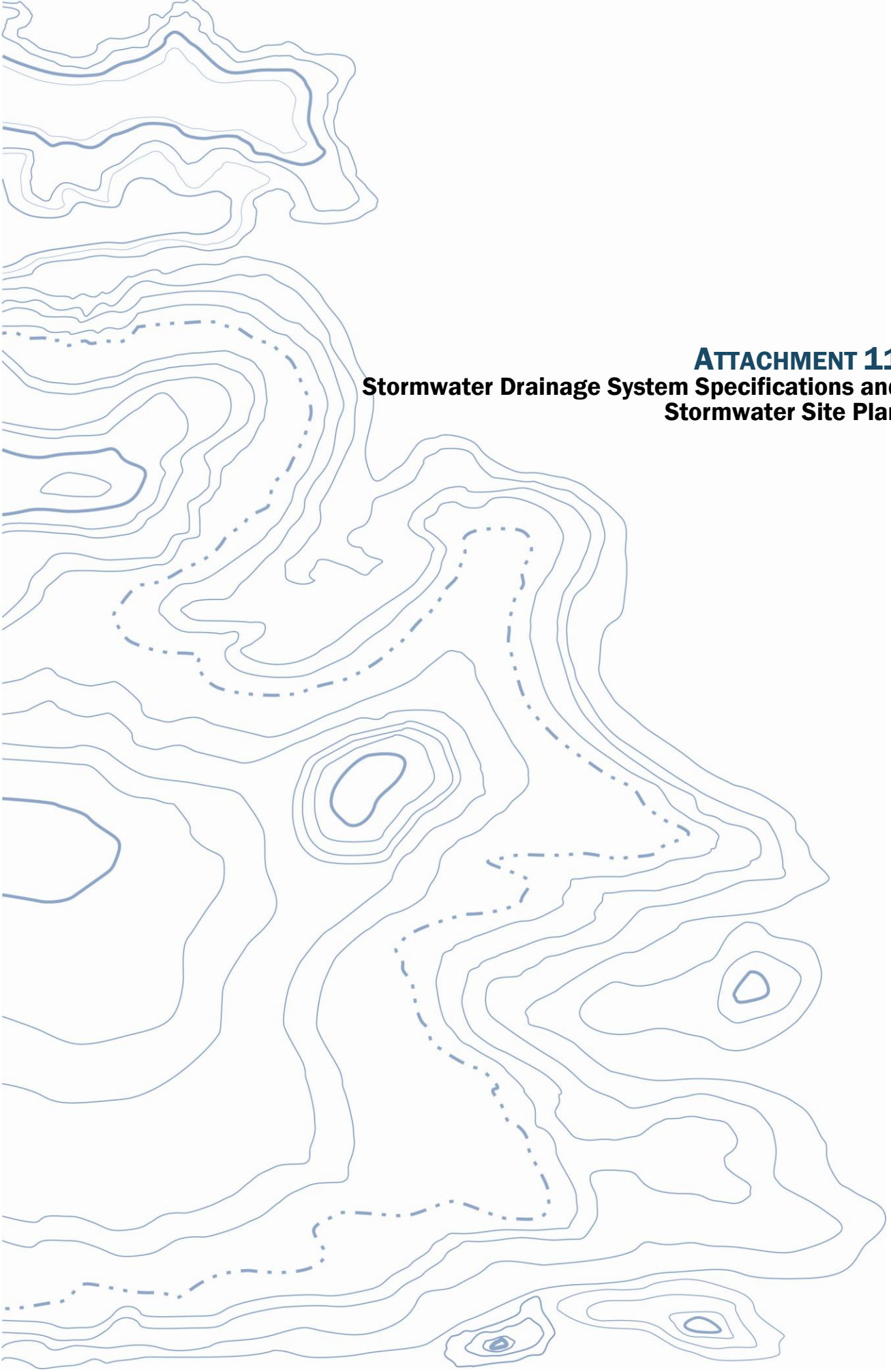
7.0 PROCEEDING WITH CONSTRUCTION

Project construction outside the discovery location may continue while documentation and assessment of the cultural resources proceed. An archaeological specialist must determine the boundaries of the discovery location. In consultation with DAHP and affected tribes, the Project Manager will determine the appropriate level o documentation and treatment of the resource. If federal agencies are involved, the agencies will make the final determinations about treatment and documentation.

Construction may continue at the discovery location only after the process outlined in this plan is followed and the Project Manager (and agencies) determine that compliance with state and federal laws is complete.

8.0 REFERENCE

This Discovery Plan has been created using the Washington State Department of Transportation Discovery Form template.



ATTACHMENT 11

Stormwater Drainage System Specifications and Stormwater Site Plan

PART 1 - GENERAL

1.01 SUMMARY

A. In general, work of this section includes, but is not limited to the following:
   1. Pipe and fittings.
   2. Nonpressure transition couplings.
   3. Cleanouts.
   4. Catch basins.
   5. StormFilter® catch basins and manholes.
   6. Connecting site drainage piping to City of Tacoma storm system.
   7. All temporary and permanent storm drainage piping, fittings, and accessories.
   8. Cleaning and flushing storm system at completion of project.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Engineer Design Report (EDR) Section 8.6, Utility Corridor Excavation and Backfill.

C. EDR Section 10.1, Erosion Control/Stormwater Pollution Prevention.

1.03 DEFINITIONS

A. CPEP: Corrugated polyethylene plastic pipe.

1.04 SUBMITTALS

A. Submit under provisions of Division 01, Section 013310, “Submittal Procedures,” and as further provided.

B. StormFilter® Catch Basin and Manhole Manufacturer’s Drawings: Show pipe sizes, locations, and elevations.

C. Certification:
   1. Provide a letter, signed by the supplier and reviewed and also signed by an officer of the Contractor’s company, certifying that the following products to be incorporated into the work meet the requirements specified.
   2. Products:
      a. Catch basins, grates, and frames.
      b. Pipe.
      c. StormFilter®.

D. Record drawings according to Division 01 Section 017800 “Closeout Submittals.”

1. Record information shall be prepared by a professional land surveyor licensed in the State of Washington and shall include all rim and invert elevations and as-built location (coordinates).
2. Record drawings for City of Tacoma Work Order drawings shall show station, offset, invert, and rim elevations to nearest 0.01 foot.
3. Record drawings for City of Tacoma Work Order drawings shall be submitted within 30 days of substantial completion.

E. Television Inspection Report: Prepared by a firm licensed to perform such analysis, submitted to Engineer minimum of 7 days before final surfacing construction is scheduled. The following shall be submitted:
   1. Video tape or CD of pipe and structures.
   2. Written report documenting stationing of sags, damaged or improper joints, and connections or other areas of concern or non-conformance. Report shall include proposed repair for all documented problem areas.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic manholes, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle StormFilter® according to manufacturer's written rigging instructions.

1.06 PROJECT CONDITIONS

A. Site Information: Perform site survey, research public utility records, and verify existing utility locations. Field verify all connection points of existing facilities and contact Engineer if proposed improvement cannot be provided.

B. Locate existing structures and piping to be closed and abandoned.

1.07 REFERENCE STANDARDS

A. WSDOT Specification: Standard Specifications for Road, Bridge and Municipal Construction, prepared jointly by the Washington State Department of Transportation, and the American Public Works Association, Washington State Chapter, 2008 edition. All references to measurement and payment shall be deleted from consideration, and terms agreed to in the contract substituted therefore.

B. WSDOT Standard Plan: Standard Plans for Road and Bridge Construction, prepared by Washington State Department of Transportation, 2008 edition.

C. City of Tacoma Surface Water Design Manual, 2008 edition.

D. City of Tacoma Work Order Standards.

PART 2 - PRODUCTS

2.01 PE PIPE AND FITTINGS

A. Corrugated PE Drainage Pipe and Fittings NPS 3 to NPS 10: AASHTO M 252M, Type S, with smooth waterway for coupling joints. Conform to WSDOT Specification 9-05.19.
   1. Soiltight Couplings: AASHTO M 252M, corrugated, matching tube and fittings.

B. Corrugated PE Pipe and Fittings NPS 12 to NPS 60: AASHTO M 294M, Type S, with smooth waterway for coupling joints. Conform to WSDOT Specification 9-05.19.
   1. Soiltight Couplings: AASHTO M 294M, corrugated, matching pipe and fittings.

2.02 NONPRESSURE TRANSITION COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:
   1. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
   2. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

2.03 MANHOLES

A. Precast Concrete Catch Basins: Conform to WSDOT Standard Plan B Series for catch basin type indicated on plans.

B. Manhole Frames and Covers:
   1. Frames and Grates: Cast or ductile iron designed for heavy-duty service, conforming to WSDOT Standard Plan B-25.20, B-30.30, B-30.40, and B-30.50 for grate type indicated. All grates and lids shall be locking.
   2. Solid Locking Lid: Cast or ductile iron conforming to WSDOT Standard Plan B-30.20.

2.04 CATCH BASINS

A. Precast Concrete Catch Basins: Conform to WSDOT Standard Plan B Series for catch basin type indicated on plans.

B. Frames and Grates: Cast or ductile iron designed for heavy-duty service, conforming to WSDOT Standard Plan B-2a, B-2b, and B-2d for grate type indicated. All grates and lids shall be locking.

C. Solid Locking Lid: Cast or ductile iron conforming to WSDOT Standard Plan B-2.

2.05 STORMFILTER®

A. Conform to manufacturer's requirements.

B. Conform to detail.

PART 3 - EXECUTION

3.01 EARTHWORK

3.02 EDR SECTION 8.6, UTILITY CORRIDOR EXCAVATION AND BACKFILL PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details (Sheets C4.0, C4.5 and C4.6) indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions and consult with the Engineer.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install manholes or catch basins for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.

F. Install gravity-flow, nonpressure drainage piping according to the following:
   1. Install piping pitched down in direction of flow.
   2. Install piping NPS 6 and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors.
   3. Install ductile-iron piping and special fittings according to AWWA C600 or AWWA M41.
   4. Install PE corrugated sewer piping according to ASTM D 2321.
   5. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.

3.03 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure drainage piping according to the following:

1. Join ductile-iron culvert piping according to AWWA C600 for push-on joints.
2. Join ductile-iron piping and special fittings according to AWWA C600 or AWWA M41.
3. Join corrugated PE piping according to ASTM D 3212 for push-on joints.
4. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasketed joints.
5. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.04 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated. Installation shall conform to WSDOT Specification Division 7.

B. Install precast concrete manhole sections with sealants according to ASTM C 891.

C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.

D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements.

3.05 CATCH BASIN INSTALLATION

A. Installation shall conform to WSDOT Specification Division 7.

B. Construct catch basins to sizes and shapes indicated.

C. Set frames and grates to elevations indicated.

3.06 CONNECTIONS

A. Make connections to existing storm drain manhole.
   1. Conform to City of Tacoma requirements for connection to storm drain manholes in East D Street and within Parcel # 9580001791.
   2. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

B. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
   1. Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.

3.07 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed.

1. Close open ends of piping with threaded metal caps, plastic plugs, concrete plugs or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

B. Abandoned Manholes and Structures: Excavate around manholes and structures as required and use one procedure below:
   1. Remove manhole or structure and close open ends of remaining piping.

C. Backfill to grade according to Sheet C3.0.

3.08 IDENTIFICATION

A. Materials and their installation are specified in Division 31 Section 312000 “Earth Moving.” Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
   1. Use detectable warning tape over ferrous piping.
   2. Use detectable warning tape over nonferrous piping and over edges of underground structures.
   3. Locate wire is not required when pipe extends from catch basin to catch basin.
   4. The ends of locate wire must be exposed within catch basin or cleanout and maintained.

3.09 FIELD QUALITY CONTROL

A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
   1. In large, accessible piping, brushes and brooms may be used for cleaning.
   2. Place plug in end of incomplete piping at end of day and when work stops.
   3. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.

B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
   1. Perform TV inspection.
   2. Submit separate reports for each system inspection.
   3. Defects requiring correction include the following:
      a. Alignment: Less than full diameter of inside of pipe is visible between structures.
      b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
      c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
      d. Infiltration: Water leakage into piping.
      e. Exfiltration: Water leakage from or around piping.
   4. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
   5. Reinspect and repeat procedure until results are satisfactory.

C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
   1. Do not enclose, cover, or put into service before inspection and approval.
   2. Test completed piping systems according to requirements of authorities having jurisdiction.
   3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice. 4. Submit separate report for each test. 5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
      a. Exception: Piping with soil tight joints unless required by authorities having jurisdiction.

D. Leaks and loss in test pressure constitute defects that must be repaired.

E. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.10 CLEANING

A. Clean interior of piping of dirt and superfluous materials. Flush with City of Tacoma hydrant water.

END OF SECTION

Stormwater Site Plan

PREPARED FOR:

Foss Waterway Development Authority
535 East Dock Street, Suite 204
Tacoma, WA 98402-4630

PROJECT:

Foss Waterway Park – Phase 1
2110 East D Street
Tacoma, WA 98402
211022.10

PREPARED BY:

Lauren Grouws, LEED® AP
Project Engineer

REVIEWED BY:

Doreen S. Gavin, PE, LEED® AP
Vice President

DATE:

December 2011

Stormwater Site Plan

PREPARED FOR:

Foss Waterway Development Authority
535 East Dock Street, Suite 204
Tacoma, WA 98402-4630

PROJECT:

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2110 East D Street
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211022.10

PREPARED BY:

Lauren Grouws, LEED® AP
Project Engineer

REVIEWED BY:

Doreen S. Gavin, PE, LEED® AP
Vice President

DATE:

December 2011

I hereby state that this Stormwater Site Plan for the Foss Waterway Park – Phase 1 project has been prepared by me or under my supervision, and meets the standard of care and expertise that is usual and customary in this community for professional engineers. I understand that the City of Tacoma does not and will not assume liability for the sufficiency, suitability, or performances of drainage facilities prepared by me.

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Appendices

Appendix A

Figures

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A-2 ..... City of Tacoma Watershed Map
A-3 ..... Determining Minimum Requirements for Redevelopment (Fig. 4)
A-4 ..... Determining Minimum Requirements for Flow Control (Fig. 5)
A-5 ..... Flood Insurance Rate Map
A-6 ..... Existing Conditions Site Map
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Appendix B

Submittal Requirements Checklist

Appendix C

Hydraulic Analysis Worksheet

Appendix D

Operations and Maintenance Manual

Appendix E

Construction Stormwater Pollution Prevention Plan
Prepared by GeoEngineers, Inc.

Appendix F

Bond Quantity Worksheet

Appendix G

Final Draft
Cleanup Action Plan for the Former American Plating Inc.
Prepared by GeoEngineers, Inc., November 24, 2003

Appendix H

Water Quality Calculations

Appendix I

Worksheet for Commercial and Industrial Activities

1.0 PROJECT OVERVIEW

This report accompanies the civil plans being submitted to City of Tacoma for the initial phase of Foss Waterway Park, which proposes the demolition of existing pavement and landscape, and capping the contaminated soils on site and grading of the disturbed site at old American Plating site (Grading Permit No. _____). A subsequent phase of construction will include the construction of a boat house, boat launch area and walking paths. This second phase will require a separate grading and drainage permit and is anticipated to start construction in the spring of 2012. The site is part of the 4.27-acre Foss Waterway Park site located at 2110 East D Street in Tacoma, Washington. Proposed improvements include demolishing the existing entrance to the Berg Scaffolding site, capping the existing site with 18" of cover under gravel and paved areas and 3' over landscape areas, grading to drain the portion of the site impacted by the soil capping, and constructing a new access driveway to the Berg Scaffolding site. Stormwater from the west portion of the site will sheet flow to the west into the Foss Waterway of Puget Sound. A portion of the east side of the site will sheet flow into East D Street and the remainder of the site will be collected and conveyed to an existing stormwater system in East D Street.

The project site is located on the north-central portion of the 10.49-acre Foss Waterway Park site, and includes an access driveway to Berg Scaffolding, which is located on the south half of the Foss Waterway Park site. The project site is located to the west of East D Street, to the east of the Foss Waterway of Puget Sound, to the north of Dock Street, and to the south of an existing parking lot located under Washington State Route 509. See Vicinity Map as Figure A-1, Appendix A. The project site includes roughly 2.5 acres. The parcel number is 8950001761, and the site address is 2110 East D Street, Tacoma, Washington 98402.

According to the City of Tacoma 2008 *Surface Water Management Manual (SWMM)*, to which the design of the stormwater facilities conforms, this project is considered a new development because the existing project site is less than 35 percent impervious. Volume 1, Chapter 3, Figure 4 was consulted to determine project requirements. It was determined from the flow charts that Minimum Requirements 1 through 12 apply to the new and converted surfaces. Stormwater is required to be treated from pollution generating surfaces because the effective pollution generating impervious surface is more than 5,000 square feet within the threshold discharge area. Flow control is not required because the project discharges to salt water and there is capacity in the downstream storm lines. The natural discharge location is described further in Section 4.0 and is proposed to remain unchanged.

The site is located within the Foss Waterway Watershed. See City of Tacoma Watershed Map as Figure A-2, Appendix A. The downstream and upstream drainage conditions are discussed in Section 3.0.

The completed Submittal Requirements Checklist is included in Appendix B, and the Hydraulic Analysis Worksheet and drawings of the proposed facilities are included in Appendix C.

2.0 EXISTING CONDITIONS SUMMARY

The project site consists of roughly 2.5 acres located at 2110 East D Street. See Vicinity Map provided as Figure A-1, Appendix A. The project area includes existing asphalt driveway that serves Berg Scaffolding and associated lay down and storage areas for Berg Scaffolding. The project site is bounded on west by East D Street, on the east of the Foss Waterway of Puget Sound, on the south of Dock Street, and to the north of an existing parking lot located under Washington State Route 509.

AHBL, Inc. performed a topographic survey of the site. Topographic relief across the project site is roughly 14 feet, generally sloping to the east and west. Drainage from the project area sheet flows to the west and discharges to the Foss Waterway of Puget Sound. See the Existing Conditions Site Map, Figure A-6, Appendix A.

GeoEngineers, Inc. prepared a Final Draft of a Cleanup Action Plan for the Former American Plating Inc., also known as Foss Waterway Park. A copy of the report is provided in Appendix G. The report indicates that the soils on the Foss Waterway Park site contaminated from past activities on the site and are not suitable for fill. The slopes onsite are no greater than 3:1, so erosion is a possibility. Soils will be stabilized to reduce their erosion potential.

There are no known historical drainage problems at this site. The project site is located adjacent to a 100-year flood hazard zone with an elevation of 9. The Flood Insurance Rate Map is included as Figure A-5 of Appendix A. There are known sensitive or critical areas on the site. There are no known existing fuel tanks on the site. There are groundwater wells or septic systems onsite; none known are within 100 feet of the site. The site contains multiple water monitoring wells that are to be demolished with this project. No other known utilities are onsite.

3.0 OFFSITE ANALYSIS

3.1 Offsite Analysis

3.1.1 Task 1 – Study Area Definition and Maps

Proposed project improvements include the demolition of asphalt driveway, capping the contaminated soils on site with soil, grading the site to drain, and building a new asphalt driveway with gravel parking areas.

The project site is located within the Foss Waterway Watershed. See Vicinity Map and City of Tacoma Watershed Map within Appendix A of this report.

3.1.2 Task 2 – Resource Review

The following resources were reviewed to discover any existing or potential problems in the study area:

1. Soils Information: A Final Draft of the Cleanup Action Plan for the Former American Plating Site was prepared by GeoEngineers, Inc. dated November 24, 2003, was prepared for the Foss Waterway Park project site. A copy of the geotechnical report is included within Appendix G of this report. The report indicates that the Foss Waterway Park site contains contaminated soils that require remediation and are not suitable for infiltration.

2. Road Drainage Problems: None to our knowledge.

3. City of Tacoma GIS Maps were consulted showing sanitary and storm sewers, contours, and streets. The GIS Maps assisted in onsite and offsite mapping of existing utilities and topographic conditions of the study area.

4. The topographic survey, prepared by AHBL for the project site, provides the background for the design of the project.

3.1.3 Task 3 – Field Inspection

A field inspection was performed on November 3, 2011, by David Nason under partly sunny conditions. The field review confirmed that the drainage on the site sheet flows to the west to the Foss Waterway of Puget Sound. Stormwater from East D Street is collected by a stormwater conveyance system in the street and flows to the north. The conveyance system discharges to the Foss Waterway of Puget Sound within a quarter-mile of the project site

3.1.4 Task 4 – Drainage System Description

From site observations, it appears that the drainage in close proximity to the project area is adequately collected and conveyed to the City of Tacoma storm systems. AHBL did not observe any indicators of problems such as erosion, ponding water, or insufficient conveyance capacity.

3.2 Upstream Qualitative Analysis

No upstream area stormwater travels onto the site. Stormwater is collected through a separate conveyance system that brings stormwater around the project site. This stormwater conveyance system located to the south and east of the project site is to remain and be protected during construction.

3.3 Qualitative Analysis

Stormwater leaving the east portion of the project site will be collected in a catch basin and treated with a StormFilter treatment manhole then discharged into an existing manhole near the southeast corner of the project site. The existing manhole has a 24-inch pipe flowing from the south and the stormwater travels through the manhole and flows to the east in a 24-inch pipe. The stormwater from the site will continue to the east into East D Street. In East D Street east of the property line and continue to flow north in a 24" storm line along the west curb line of East D Street. This line also collects stormwater from East D Street. North of the existing parking to the north of the site, the conveyance system flows to the west in a 48" storm line under SR 509 and discharges to the Foss Waterway of Puget Sound. A rubber check valve is located at the outfall of the pipe to prevent seawater from backing up into the drainage system during high tides.

The west portion of the site will follow the natural drainage path and continue to sheet flow to the west. The stormwater will sheet flow into the Foss Waterway of Puget Sound. Foss Waterway is saltwater so flow control is not required.

3.4 Quantitative Analysis

The project discharges directly to salt water therefore a quantitative analysis was completed to show that there is capacity in the downstream conveyance system in order to not provide flow control.

4.0 PERMANENT STORMWATER CONTROL PLAN

4.1 Pre-Developed Site Hydrology

The proposed project area is roughly 1.50 acres of land that are covered with existing asphalt driveway, landscape areas, and concrete parking area. For modeling purposes, the entire site is treated as one basin, with the existing land cover and pre-developed forested condition modeled. The site soils are poor, and Hydrologic Soil Group C was used in the hydrologic model with flat slopes.

Figure A-6 in Appendix A provides an Existing Conditions Site Map. Contributing drainage areas are outlined in the table below.

Table 1: Pre-Developed Land Cover, Area, and Flows

	A_{imp} (ac)	A_{perv} (ac)	Total (ac)
Pre-Developed Basin	0	1.494 (Lawn, Flat, Soil Group C)	1.494
Existing Basin	0.358 (Driveways/Flat) 0.092 (Parking/Flat)	1.044 (Flat lawn, Soil Group C)	1.494

	2-Yr	10-Yr	25-Yr	100-Yr
Pre-Developed Peak Flow (cfs)	0.0323	0.0654	0.0828	0.1086
Existing Basin Peak Flow (cfs)	0.1838	0.3272	0.4139	0.5624

4.2 Developed Site Hydrology

The project area includes roughly 1.5 acres of land. The pervious land cover includes lawn. Impervious surfaces on site include gravel and asphalt. The gravel areas were modeled as parking and the asphalt areas as driveways. The site soils are poor and modeled as Hydrologic Soil Group C. The site slopes are flat.

Figure A-7 in Appendix A provides a Developed Conditions Site Map. Contributing drainage areas are outlined in the table below.

Table 2: Proposed Land Covers, Areas, and Flows

	A_{Imp} (ac)	A_{perv} (ac)	Total (ac)
Developed Basin	0.458 (Driveways/Flat) 0.639 (Parking, Flat)	0.397 (Flat lawn, Soil Group C)	1.494

	2-Yr	10-Yr	25-Yr	100-Yr
Developed Peak Flow (cfs)	0.335	0.540	0.656	0.845

4.3 Performance Goals and Standards

This project disturbs more than 7,000 square feet of land and grades/fills more than 500 cubic yards of material; therefore, according to Figure 4, Volume 1, Chapter 3 of the *SWMM*, this project must comply with Minimum Requirements 1 though 12 for the new and converted surfaces.

The total effective pollution-generating impervious surface is greater than 5,000 square feet within the threshold discharge area of the project; therefore, water quality is required.

Table 3: Proposed Site Characteristics

Threshold Discharge Area ID:	
Total pollution generating pervious surface (PGPS)	0 acres
Total pollution generating impervious surface (PGIS)	0.902 acres
Native vegetation converted to lawn/landscape	0 acres
Total effective impervious surface	1.097 acres
Increase in 100-year storm peak	0.283 cfs

4.4 Flow Control System

In accordance with the 2008 *SWMM*, the project is not required to provide flow control. Flow control is not required because the stormwater from the project directly discharges to salt water and there is capacity in the downstream system to carry the additional flow. A quantitative analysis was performed and is discussed in Section 3.4. Stormwater from the site will sheet flow from the site to the Foss Waterway of Puget Sound, sheet flow to East D Street, or sheet flow to a treatment facility for water quality treatment before being discharged to the existing stormwater system in East D Street.

4.5 Water Quality System

The project will create pollution generating impervious surface; therefore, water quality is required. The gravel and asphalt areas on the site located to the east of the proposed fence area all considered pollution generating impervious surfaces (PGIS). The pollution generating impervious surfaces are in two separate sub basins so two separate water quality filter units will provide treatment to the targeted surfaces.

Water quality will be provided for the south PGIS through a StormFilter 72-inch Manhole with 6 cartridges. The north PGIS will be treated with a 3 cartridge StormFilter catch basin. The StormFilters were designed to treat the 15-minute time series from WWHM3. This flow rate is at or below which 91% of the runoff volume, as estimated by WWHM3. Water Quality Calculations are included in Appendix H.

Table 4: Water Quality Land Covers, Areas, and Flows

Basin	**A_{imp} (ac)**	**A_{perv} (ac)**	**Total (ac)**	**Design Flow Rate**
North Basin	0.220 (Driveways/Flat) 0.027 (Parking, Flat)	0.086 (Flat lawn, Soil Group C)	0.333	0.037

South Basin	0.266 (Driveways/Flat) 0.303 (Parking, Flat)	0	0.569	0.088

4.6 Conveyance System Analysis and Design

New onsite stormwater systems were sized to convey the 10-year storm event without surcharge, as stipulated by the 2008 *SWMM*. Detailed calculations are provided in Appendix C of this report.

4.6.1 Analysis Data

Hydraulic analysis for the development was performed using the hydraulic runoff model called StormSHED2G™, produced by Engenious Systems Inc. of Seattle, Washington. The model used Santa Barbara Urban Hydrograph (SBUH) Methodology developed by the Santa Barbara County Flood Control and Water Conservation District in California.

The StormSHED2G computer program computed the peak flows for each sub-basin for the single-event design storm. In accordance with the requirements of the 2008 *SWMM*, the 10-year, 24-hour storm event was analyzed. The Type 1A rainfall distribution and 4-inch depth of precipitation were used. Curve numbers used for landscape and impervious roofs and concrete are 86 and 98, respectively. Detailed calculations are provided in Appendix C.

4.6.2 Analysis Results

The conveyance system was designed to convey and contain the 10-year storm event without surcharging the storm system. The stormwater regulation also states that pipe sizes for private storm systems may be less than 10 inches in diameter if they are sized appropriately for the design flows with no surcharging. The regulation also requires that flow velocities must be greater than 2 feet per second at full flow.

The StormSHED2G analysis demonstrates that all pipe runs within the conveyance network are of adequate size and slope to not flow full for the 10-year design storm event. The analysis also shows that the required minimum velocity of 2 feet per second is achieved for the design storm. Detailed conveyance calculations are provided in Appendix C.

If a storm event occurs that exceeds the conveyance system capacity, overflows from the system will not adversely impact access to new or existing structures, or impact emergency access onsite.

5.0 MINIMUM AND ADDITIONAL REQUIREMENTS

5.1 Minimum Requirements

5.1.1 M.R. #1 – Preparation of Stormwater Site Plans

The proposed project exceeds the thresholds for impervious surfaces and therefore requires a Stormwater Site Plan for local government review. This report provides the

Stormwater Site Plan narrative, exhibits, figures, and calculations. The Grading and Drainage Plans and Details provide the engineered plans.

5.1.2 M.R. #2 – Construction Stormwater Pollution Prevention Plan (SWPPP)

The proposed project is required to provide a Construction Stormwater Pollution Prevention Plan (SWPPP), including narrative and Erosion Control Plans. The Construction SWPPP complies with the 12 Elements identified in the *SWMM.* The Construction SWPPP is included in Appendix E.

5.1.3 M.R. #3 – Source Control of Pollution

The proposed project is required to provide source control of pollution. All source control will occur outside. Storage Activities include Storage and Treatment of Contaminated Soils (BMP A402) and Parking and Storage for Vehicles and Equipment. Soils onsite are considered contaminated and are to be excavated and left on-site and the developed site will be used for parking and storage of scaffolding. Construction Activities will follow Clearing, Grading, and Preparation of Construction Sites (BMP A502) because the project involves clearing and grading. Dust Control and Soil and Sediment Control will follow Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots (BMP A601) and Soil Erosion and Sediment Control at Industrial Sites (BMP A603). The gravel areas on site will be sued for parking. Other Activities will follow Maintenance of Public and Private Utility Corridors and Facilities (BMP A711) and Maintenance of Stormwater Drainage and Treatment Facilities (BMP A713). An existing public utility corridor is located at the southeast corner of the site that will be maintained. The onsite stormwater system and treatment facility will be maintained by the owner. Source Control BMPs to be followed include Disposal of Contaminated Stormwater and Waste Materials Properly (BMP S102), Discharge Process Wastewater to Sanitary Sewer, Holding Tank, or Water Treatment System (BMP S103) and Cleaning Catch Basins (BMP S109). Stormwater from the site running off the contaminated soils will be monitored to determine where they can be safely discharged. The Construction SWPPP provides details on the control of pollution during construction. Appendix I includes the Worksheet for Commercial and Industrial Activities, along with all applicable BMPs.

5.1.4 M.R. #4 – Preservation of Natural Drainage Systems and Outfalls

Currently, the site sheet flows to the west into the Foss Waterway of Puget Sound. In the developed condition, the stormwater onsite from the pollution generating surfaces will be collected and treated prior to discharge to an existing stormwater conveyance system in East D Street. The existing storm drainage conveyance system in East D Street discharges to the Foss Waterway of Puget Sound within a quarter-mile of the site. The existing drainage basin is described in Section 2.0 of this report.

5.1.5 M.R. #5 – Onsite Stormwater Management

This project will not employ soil quality Best Management Practices (BMPs) to meet this requirement. Phase 2 of the project will employ soil quality BMPs to meet this requirement. Dispersion systems and dispersion are not proposed for this site because the site soils are considered contaminated. Because the site contains contaminated soils, infiltration is also discouraged.

5.1.6 M.R. #6 – Runoff Treatment

Water quality is required on this project because the total effective pollution generating impervious surface (PGIS) is greater than 5,000 square feet for the threshold discharge area. A portion of the PGIS from the site will sheet flow from the site to East D Street. An equivalent area of PGIS will be treated on the adjacent Berg Scaffolding site to meet runoff treatment requirements. Runoff treatment will be provided on site by a StormFilter manhole. The Water Quality System is discussed in Section 4.5, and calculations are provided in Appendix H.

5.1.7 M.R. #7 – Flow Control

The proposed project is not required to provide flow control in accordance with the 2008 *SWMM*. Flow control is not required because the project site directly discharges to salt water and there is capacity in the downstream system to carry the additional flow. The flow control is discussed in Section 4.0, and calculations are provided in Appendix C.

5.1.8 M.R. #8 – Wetlands Protection

The stormwater from the project site does not discharge into a wetland, either directly or indirectly, through a conveyance system.

5.1.9 M.R. #9 – Basin/Watershed Planning

To our knowledge, no additional requirements are imposed on this project due to any basin/watershed plans.

5.1.10 M.R. #10 – Operations and Maintenance

The operations and maintenance requirements are discussed in Section 6.0 and Appendix D.

5.1.11 M.R. #11 – Offsite Analysis and Mitigation

See Section 3.3 for a Qualitative Analysis and Section 3.4 for the Quantitative Analysis of the offsite storm system. Because we are discharging to an existing stormwater system that directly discharges to salt water and the downstream system is not known to be at capacity, no additional mitigation is proposed.

5.1.12 M.R. #12 – Financial Liability

The proposed project shall comply with City of Tacoma financial liability requirements.

6.0 OPERATIONS AND MAINTENANCE MANUAL

Operations and maintenance will be the responsibility of the owner, Foss Waterway Development Authority. Mr. Su Dowie is the main contact person at Foss Waterway Development Authority. His contact information is as follows:

Mr. Su Dowie
535 East Dock Street, Suite 204
Tacoma, WA 98402
Phone: (253) 597-8122

All drainage facilities shall be maintained and operated in compliance with City of Tacoma maintenance standards. See Appendix D for the Operations and Maintenance Manual for privately-maintained drainage facilities, a copy of which shall be kept onsite at all times at the Foss Waterway Development Authority office.

7.0 SPECIAL REPORTS AND STUDIES

A Final Draft of the Cleanup Action Plan for the Former American Plating Inc. site, also known as Foss Waterway Park, was prepared by GeoEngineers, Inc. for the project site. A copy of the report is included in Appendix G.

8.0 BOND QUANTITY WORKSHEET

The Bond Quantity Worksheet for the *SWMM* is provided for the proposed project and is included in Appendix F.

9.0 CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

The proposed development shall comply with guidelines set in the *SWMM*. The plan includes erosion/sedimentation control features designed to prevent sediment-laden runoff from leaving the site or adversely affecting critical water resources during construction. A Construction SWPPP has been prepared for this project and is included in Appendix E.

10.0 CONCLUSION

This site has been designed to meet the City of Tacoma 2008 *SWMM* guidelines for stormwater management.

It was determined utilizing these criteria that:

- Flow control facilities are not required in accordance with the *SWMM*.
- Water quality facilities are required in accordance with the *SWMM*.

This analysis is based on data and records either supplied to or obtained by AHBL, Inc. These documents are referenced within the text of the analysis. The analysis has been prepared utilizing procedures and practices within the standard accepted practices of the industry. We conclude that this project, as proposed, will not create any new problems within the existing downstream drainage system. This project will not noticeably aggravate any existing downstream problems due to either water quality or quantity.

AHBL, Inc.

Lauren Grouws

Lauren Grouws, LEED® AP
Project Engineer

LKG/

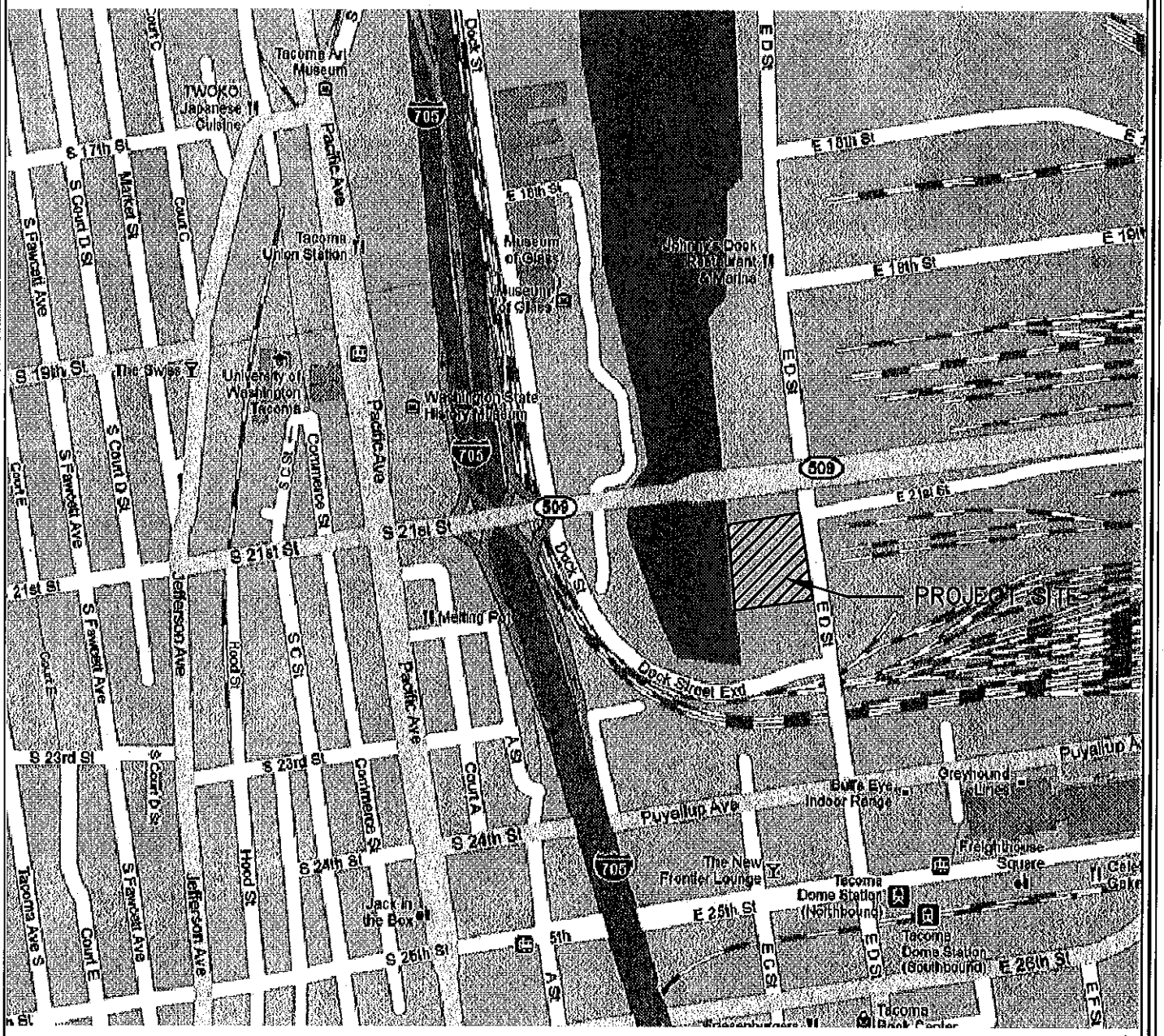
December 2011

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Appendix A

Figures

A-1 .....Vicinity Map
A-2 .....City of Tacoma Watershed Map
A-3 .....Determining Minimum Requirements for Redevelopment (Fig. 4)
A-4 .....Determining Minimum Requirements for Flow Control (Fig. 5)
A-5 .....Flood Insurance Rate Map
A-6 .....Existing Conditions Site Map
A-7 .....Developed Conditions Site Map



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VICINITY MAP

A-1

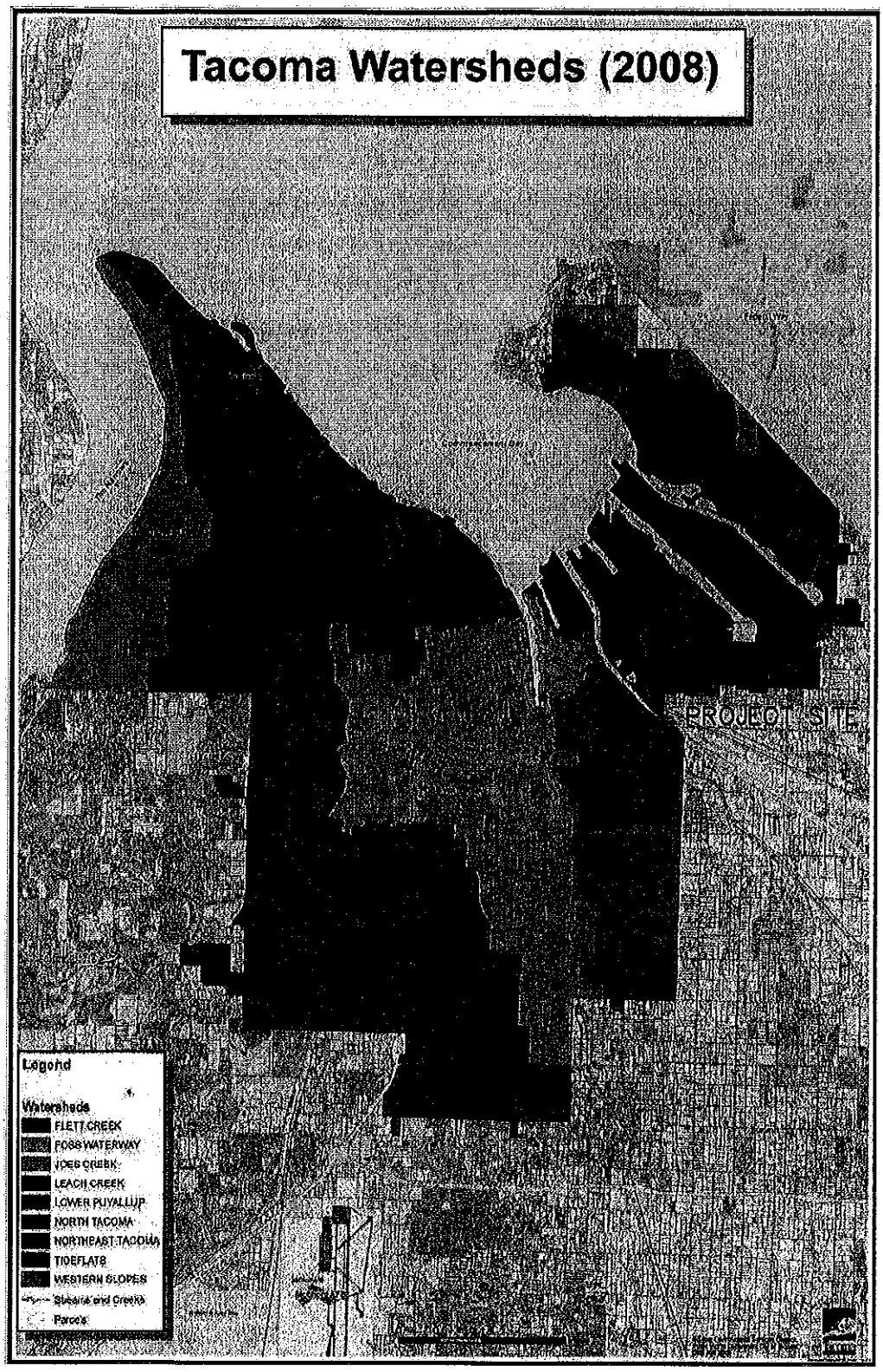


Figure 1. City of Tacoma Watersheds

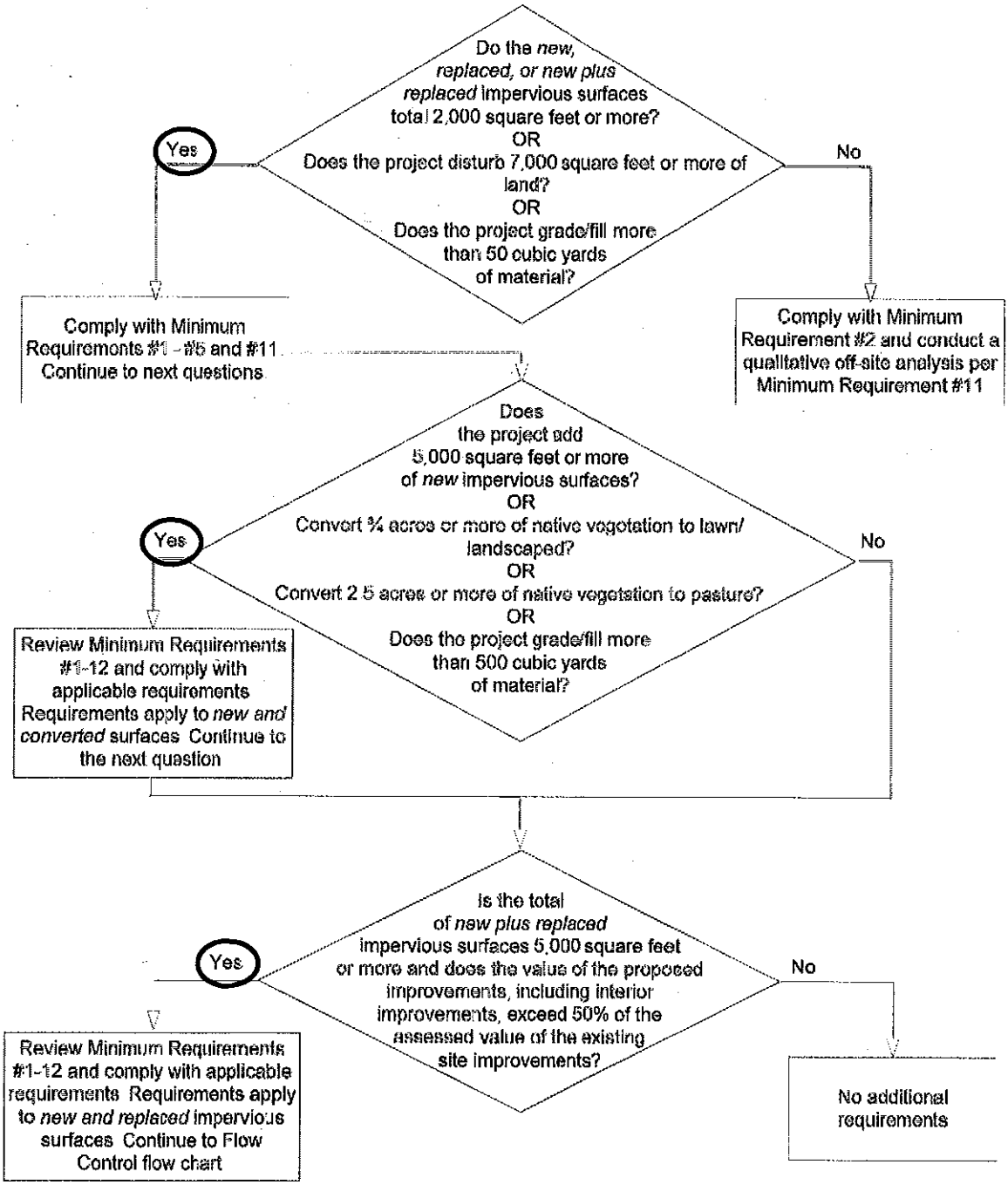
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CITY OF TACOMA WATERSHED MAP

A-2



NOTICE: Refer to Critical Area for exemption or change to this figure.

NOTES:

1. The combined total of *new and replaced* surfaces since January 1, 2003 shall apply when determining the thresholds
2. Minimum Requirement #12 may apply to any project regardless of site size
3. Watershed specific requirements may or may not require compliance with certain minimum requirements regardless of site size
4. It is the applicant's responsibility to determine the first natural discharge location for all projects

Figure 4. Determining Minimum Requirements for New and Redevelopment Project Sites

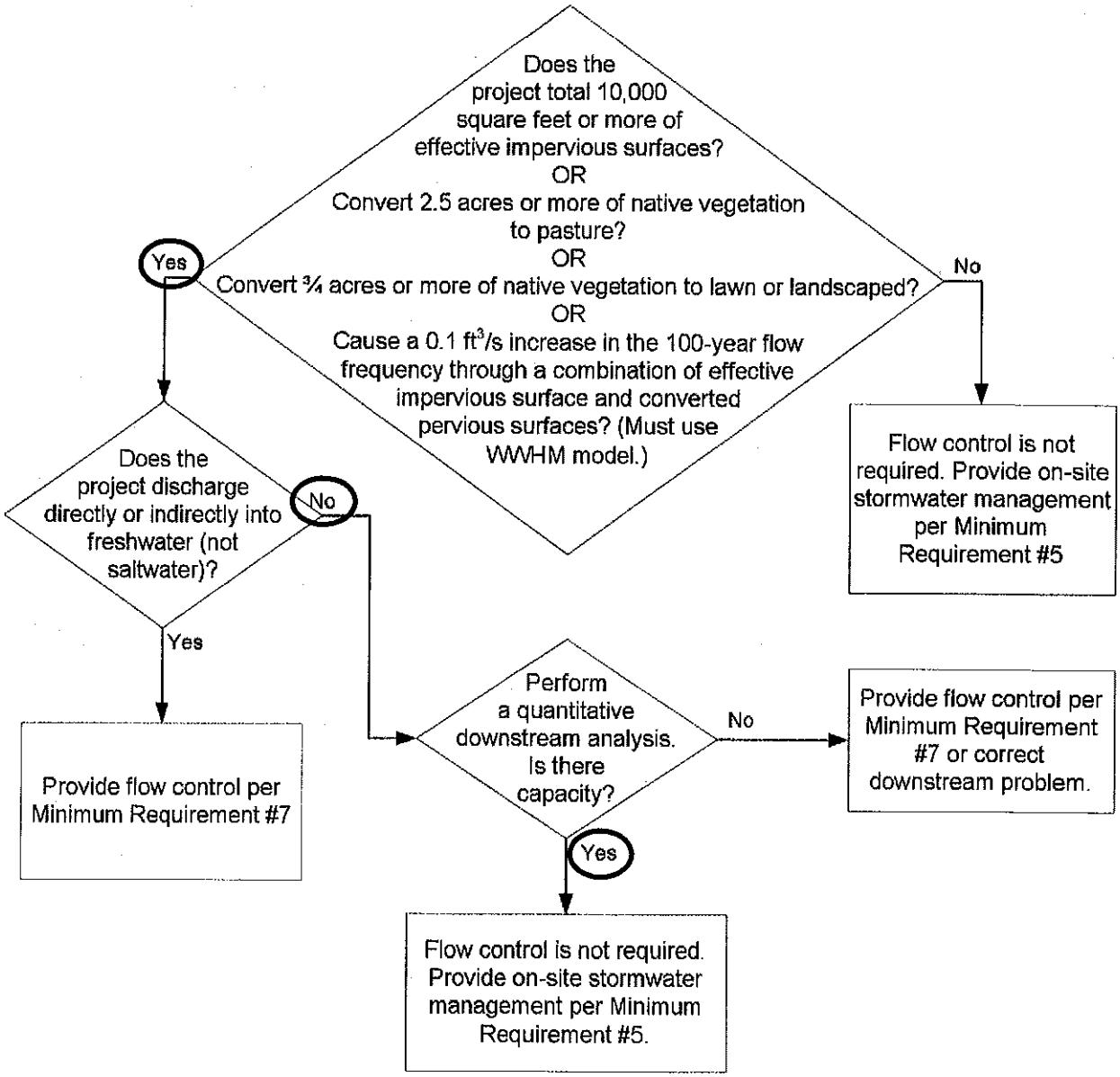
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DETERMINING MINIMUM REQUIREMENTS (FIGURE 4)

A-3



NOTICE: Refer to errata sheet for a description of changes to this figure.

NOTES:

1. Minimum Requirement #12 may apply to any project regardless of site size.
2. Watershed specific requirements may or may not require compliance with certain minimum requirements regardless of site size.
3. Direct discharges into the Puyallup River do not require flow control. Provide on-site stormwater management per Minimum Requirement #5.
4. It is the applicant's responsibility to determine the final natural discharge location for all projects.

Figure 5. Determining Minimum Requirements for Flow Control

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FLOOD INSURANCE RATE MAP

A-5

EAST D STREET

CALCULATED MEANDER CORNER PER ROS 200305275001

CONDUIT

IRRIGATION CONTROL STATION

CONCRETE WALK AT STREET LEVEL

CONCRETE WALL

UTILITY EASEMENT AFN 200503090741

UTILITY EASEMENT AFN 200503090744

STMH 601 RIM=9.61
24" CONC N-S
CENTER CHANNEL=2.66
12" CONC SE IE=5.01
LADDER W FLOW N

6' CHAIN LINK

GRAVEL DRIVE

INGRESS EGRESS

EDGE OF ASPHALT

STCB 600 RIM=9.53
12" CONC N IE=6.21

STMH 6000 RIM=11.42
24" CONC E IE=4.17
24" CONC S IE=4.24

GRAVEL PARKING AREA

ASPHALT DRIVE ENTRANCE

HUMAN POWERED WATERCRAFT FLOAT EASEMENT AFN 200710170224

90'

PARCEL B

EXPOSED EDGES OF ASPHALT

STMH 5026 RIM=15.25
24" CONC N IE=4.77
24" CONC SW IE=4.80

STMH 5027 RIM=15.23
24" CONC NE IE=4.87
10" CONC SW IE=5.05
12" CONC S IE=5.05
LADDER N

GREASE TRAP
1368 RIM=8.21
4" IP W IE=7.61

FOSS LANDING, LLC
8950001751

6' CHAIN LINK

40'

CONCRETE DEBRIS CHUNKS

PARCEL A
8950001751

STCB 1446 RIM=7.80
FULL OF WATER

FF=8.53

STCB 1369 RIM=8.38
4" IP E IE=7

2130 EAST D STREET

FF=8.59

AREA WAS COVERED WITH SCAFFOLDING AT TIME OF SURVEY

5' WIRE

CONCRETE ECOLOGY BLOCK WALL

6' CHAIN LINK

8" PVC
IE=3.12

6" IP
IE=5.55

10" PVC
IE=4.23

CONCRETE ECOLOGY BLOCK

FOSS LANDING, LLC
8950001740

FOSS WATERWAY

ORDINARY HIGH WATER PER DEPARTMENT OF ECOLOGY NGVD 29 ELEVATION 8.64'. (ELEVATION ESTABLISHED FOR URBAN WATERS PROJECT)

GRAPHIC SCALE

0 20 40 80 FEET

1" = 40 FEET

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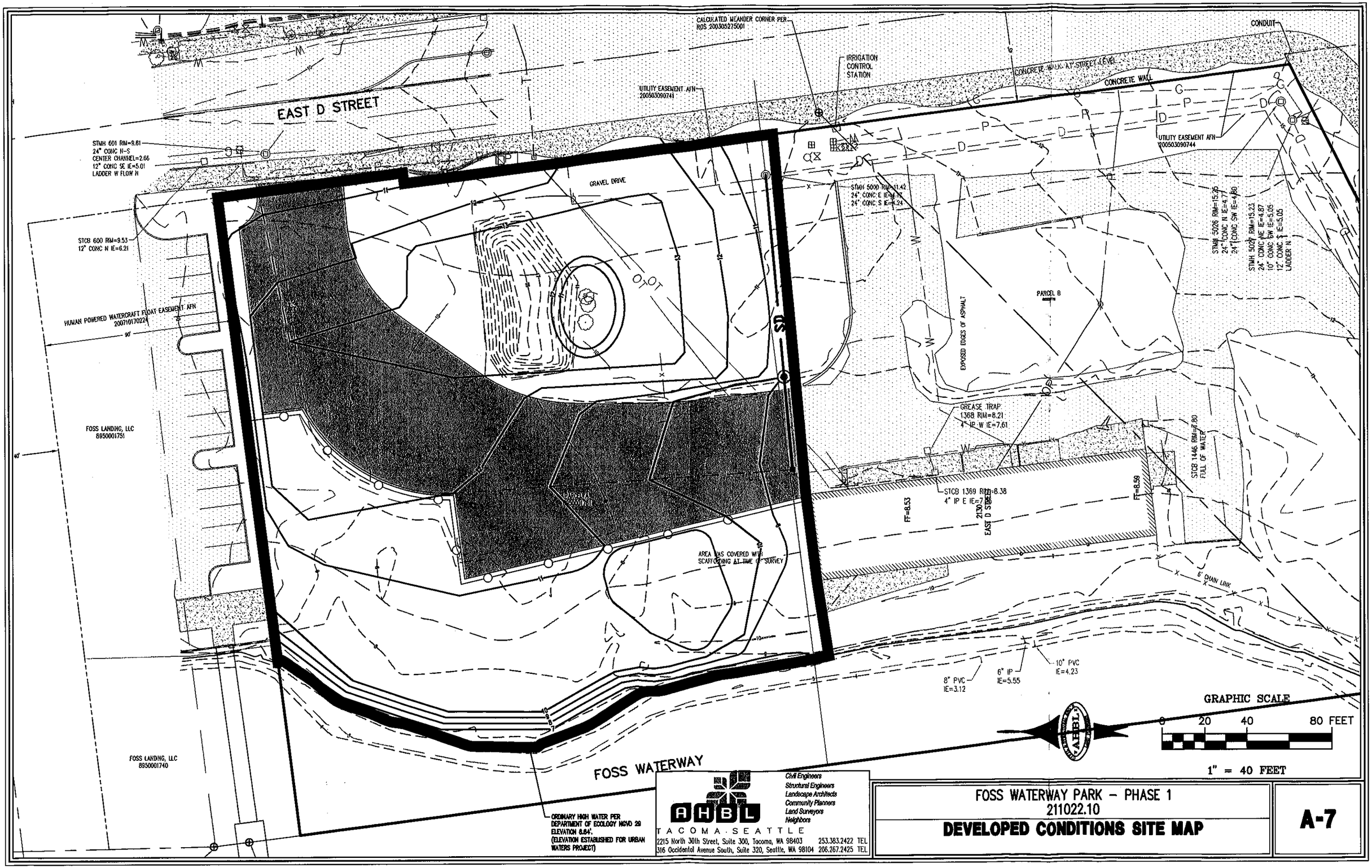
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EXISTING CONDITIONS SITE MAP

A-6



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DEVELOPED CONDITIONS SITE MAP

A-7

Appendix B

Submittal Requirements Checklist

Appendix B Stormwater Site Plan Submittal Requirements Checklist

The Submittal Requirements Checklist is intended to aid the design engineer in preparing a Stormwater Site Plan. All items included in the following checklist must be addressed as part of any stormwater site plan. The City recommends the design engineer follow the order and structure of the checklist to facilitate review, which in turn will expedite permit issuance.

Chapter 1 – Project Overview

The project overview is intended to be a summary of detailed information contained in the body of the Stormwater Site Plan.

- ☐ Identify type of permit requested and permit number
- ☐ Identify other permits required (e.g. hydraulic permits, Army Corps 404 permits, wetlands, etc.).
- ☐ Identify the project location (including address, legal description, and parcel number).
- ☐ Brief description of project to include the following:
  - ☐ Current and proposed condition/land-use
  - ☐ Size of parcel
  - ☐ Acreage developed, redeveloped, replaced or converted by the project
  - ☐ Current assessed value and cost of proposed improvements (for redevelopment projects)
  - ☐ Watershed
  - ☐ Proposed flow control improvements
  - ☐ Proposed runoff treatment improvements
  - ☐ Proposed conveyance improvements
  - ☐ Proposed discharge location and improvements
  - ☐ Downstream condition, impacts and problem
  - ☐ Locations of surface water run-on to the property
  - ☐ Reference appropriate Sections/Chapters/Appendices of the document for detailed descriptions.

Chapter 2 – Existing Condition Summary

The Existing Condition Summary is intended to provide a complete understanding of the project site and must be based on thorough site research and investigation.

- ☐ Describe, discuss and identify the following for the project site:
  - ☐ Topography
  - ☐ Land use and ground cover
  - ☐ Natural and man-made drainage patterns
  - ☐ Points of entry and exit for existing drainage to and from the site
  - ☐ Any known historical drainage problems such as flooding, erosion, etc.
  - ☐ Existing utilities (storm, water, sewer)
  - ☐ Areas with high potential for erosion and sediment deposition
  - ☐ Locations of sensitive and critical areas (i.e. vegetative buffers, wetlands, steep slopes, floodplains, geologic hazard areas, streams, creeks, ponds, ravines, springs, etc).
  - ☐ Existing fuel tanks
  - ☐ Groundwater wells on-site and within 100 feet of site

- ☐ Septic systems on-site and/or within 100 feet of the site

☐ Identify difficult site conditions.
☐ State whether the project is located in an aquifer recharge area or wellhead protection area as defined by the Tacoma-Pierce County Health Department, the Environmental Protection Agency or by the City.
☐ Identify any Superfund areas in the vicinity, and state whether they are tributary to, or receive drainage from, the project site.
☐ Identify any specific requirements included in a basin plan for the area.
☐ Include references to relevant reports such as basin plans, flood studies, groundwater studies, wetland designations, sensitive area designations, environmental impact statements, environmental checklists, lake restoration plans, water quality reports, etc. Where such reports impose additional conditions on the Proponent, state these conditions and describe any proposed mitigation measures.
☐ Grading Plan per requirements.
☐ A soil report to identify the following:
- ☐ Soil types
- ☐ Hydrologic soil group classification
- ☐ Groundwater elevation
- ☐ Presence of perched aquifers, aquitards and confined aquifers
- ☐ Location of test pits
- ☐ Infiltration rates determined per the requirements of Volume 3 (where applicable)
- ☐ Discussion of critical areas or geologic hazards where present

☐ Soil reports should be contained in Appendix A of the report or as a separate document.
☐ Describe the 100-year flood hazard zone.

Chapter 3 – Off-Site Analysis

The City requires a qualitative discussion of the off-site upstream and downstream system for all projects. Where 10,000 square feet or more of new impervious surface is added and flow control is not provided, a quantitative analysis is also required. Detailed calculations will be contained in Appendix B of the report. Volume 1, Chapter 4 describes the Off-site Analysis. In addition, a list of elements to be included is provided as follows.

Qualitative Analysis

☐ Review all available plans, studies, maps pertaining to the off-site study area.
☐ Investigate the drainage system ¼ mile downstream from the project by site visit, including the following items:
- ☐ Problems reported or observed during the resource review
- ☐ Existing/potential constrictions or capacity deficiencies in the drainage system
- ☐ Existing/potential flooding problems
- ☐ Existing/potential overtopping, scouring, bank sloughing, or sedimentation
- ☐ Significant destruction of aquatic habitat (e.g., siltation, stream incision)
- ☐ Existing public and private easements through the project site and their corresponding widths
- ☐ Qualitative data on features such as land use, impervious surface, topography, soils, presence of streams, and wetlands
- ☐ Information on pipe sizes, channel characteristics and drainage structures
- ☐ Verification of tributary drainage areas

- ☐ Date and weather at the time of the inspection

☐ Describe the drainage system and its existing and predicted problems through observations, reports, and hydraulic modeling (as necessary) of the City-specified design storm event described in Chapter 3 of Volume 3. Describe all existing or potential problems as listed above (e.g. pooling water or erosion). The following information shall be provided for each existing or potential problem:

- ☐ Magnitude of or damage caused by the problem
- ☐ General frequency and duration
- ☐ Return frequency of storm or flow when the problem occurs (may require quantitative analysis)
- ☐ Water elevation when the problem occurs
- ☐ Names and concerns of the parties involved
- ☐ Current mitigation of the problem
- ☐ Possible cause of the problem
- ☐ Whether the project is likely to aggravate the problem or create a new one

☐ Properly include off-site areas in drainage calculations.

Quantitative Analysis (see Volume 3, Section 3.1.2)

☐ Clearly describe tail water assumptions.
☐ Summarize results in text.
☐ Include calculations in Appendix B of the report.
☐ Discuss potential fixes for capacity problems.
☐ Provide profiles where appropriate.

Chapter 4 – Permanent Stormwater Control Plan

Chapter 4 will contain the information used to select, size and locate permanent stormwater control BMPs for the project site.

Pre-Developed Site Hydrology

☐ Provide a list of assumptions and site parameters for the pre-developed condition.
☐ Identify all sub-basins within, or flowing through, the site. Use consistent labeling for all sub-basins throughout figures, calculations and text.
☐ For each sub-basin, identify current land use, acreage, hydrologic soil group and land use to be modeled under pre-developed conditions. The format used in Example Table 1 show below is recommended.
☐ Provide justification for land uses other than forest.
☐ Summarize output data from the pre-developed condition. Example Table 2a or 2b are recommended formats.
☐ Include completed Hydraulic Analysis worksheet (see Appendix C in this volume) and hydrologic calculations in Appendix C of the report.
☐ For WWHM models, provide model files electronically.

Example Table 1

Sub-Basin ID	Land Use and Cover Condition	Acreage	Soil Group	Modeled as: (List CN)	Comments

Example Table 2a

Pre-Developed Condition Event Output: SBUH			
Basin ID:			
	Peak Flow (cfs)	**Volume (ac-ft)**	**Area (ac)**
2-year existing			
10-year existing			
25-year existing			
100-year existing			

Example Table 2b

Pre-Developed Condition Event Output: WWHM		
Basin ID:		
	Peak Flow (cfs)	**Area (ac)**
2-year existing		
10-year existing		
25-year existing		
100-year existing		

Developed Site Hydrology

- ☐ Provide a list of assumptions and site parameters for the developed condition.
- ☐ Identify all sub-basins within, or flowing through, the site. Use consistent labeling for all sub-basins throughout figures, calculations and text.
- ☐ For each sub-basin, identify current land use, acreage, hydrologic soil group and land use to be modeled under developed conditions. The format used in Example Table 1 is recommended.
- ☐ Summarize output data from the developed condition. The formats used in Example Table 2a or 2b are recommended.
- ☐ Include completed Hydraulic Analysis worksheet (see Appendix C in this volume) and hydrologic calculations in Appendix C of the report.

Performance Goals and Standards

- ☐ Indicate total acreage of impervious surfaces, pollution-generating impervious surfaces and pollution-generating pervious surfaces for each Threshold Discharge Area (TDA). The format used in Example Table 3 is recommended.
- ☐ Include applicable decision chart (Figure 4, Figure 5 or Figure 6) with treatment requirements

clearly marked and supported.

- ☐ Include applicable decision chart (Figure 5) with flow control requirements clearly marked and supported. If flow control facilities are required, indicate that they are required.
- ☐ State conclusions from decision and flow charts.

Example Table 3

Threshold Discharge Area ID:	
Total pollution generating pervious surface (PGPS)	acres
Total pollution generating impervious surface ((PGIS)	acres
Native vegetation converted to lawn/landscape	acres
Total effective impervious surface	acres
Increase in 100-yer storm peak	cfs

Flow Control System (where required)

- ☐ Identify sizing system used.
- ☐ Summarize model results.
- ☐ Describe proposed flow control system and appurtenances, including size, type and characteristics of storage facility and control structure.
- ☐ Provide a drawing of the flow control facility and its appurtenances, including:
- ☐ Include Hydraulic Analysis Worksheet, calculations, and computer printouts (including stage storage tables) for the flow control system to be included in Appendix C of the report.

Water Quality System (where required)

- ☐ Identify the sizing method used.
- ☐ Summarize model results.
- ☐ Identify treatment methods used, including size, type and characteristics of treatment facility and appurtenances.
- ☐ Provide a drawing of the treatment facility and its appurtenances, including:
  - ☐ Dimensions
  - ☐ Inlet/outlet sizes and elevations
  - ☐ Location of the facility on the project site
  - ☐ Appurtenances/fittings
- ☐ Calculations for the water quality design storm and facility sizing calculations must be included in Appendix D of the report.
- ☐ Where appropriate, include manufacturer's specifications in Appendix D of the report.

Conveyance System Analysis and Design

- ☐ Illustrate the proposed conveyance system on a project site plan.
- ☐ Identify pipe sizes, types and slopes.
- ☐ Describe capacities, design flows and velocities for each reach.
- ☐ Include conveyance calculations in Appendix E of the report.

Chapter 5 – Discussion of Minimum Requirements

Chapter 5 is intended as a checklist for the applicant and reviewer to verify that the applicable Minimum Requirements have been met within the project submittal.

- ☐ Include applicable flowcharts for determining minimum requirements (Figure 4, Figure 5 or Figure 6) with decision path clearly marked.
- ☐ List the minimum requirements that apply to the project.
- ☐ Discuss how the project satisfies each minimum requirement.
- ☐ Indicate where in the project documentation each minimum requirement is satisfied.

Chapter 6 – Operation and Maintenance Manual

The Operation and Maintenance Manual may be included in the Stormwater Site Plan, however it shall be written with the intention of becoming a stand-alone document for the project owner once the project is complete. The Operation and Maintenance Manual must include:

- ☐ A narrative description of the on-site storm system.
- ☐ An 11 x 17 inch map of the site, with the locations of the **treatment/detention/infiltration/etc.** facilities prominently noted. This is needed to enable the Operation and Maintenance manual to be a stand-alone document.
- ☐ The person or organization responsible for maintenance of the on-site storm system, including the phone number and current responsible party.
- ☐ Where the Operation and Maintenance manual is to be kept. Note that it must be made available to the City for inspection.
- ☐ A description of each flow control and treatment facility, including what it does and how it works. Include any manufacturer's documentation.
- ☐ A description of all maintenance tasks and the frequency of each task for each flow control and treatment facility. Include any manufacturer's recommendations.
- ☐ A sample maintenance activity log indicating emergency and routine actions to be taken.

Chapter 7 – Construction Stormwater Pollution Prevention Plan

- ☐ Short-Form – Please refer to Volume 2 – Appendix C for a complete checklist, or
- ☐ Formal/Long-Form – Please refer to Volume 2 – Chapter 2 for a complete checklist.

Appendices

- ☐ Appendix A – Operations and Maintenance Manual
- ☐ Appendix B – Construction Stormwater Pollution Prevention Plan
- ☐ Appendix C – Submittal Requirements Checklist
- ☐ Appendix D – Hydraulic Analysis Worksheet
- ☐ Appendix E – Bond Qualities Worksheet
- ☐ Appendix F – Other reports, as required

Required Drawings

Project drawings shall be provided as required in Chapter 4, and shall include the following:

- ☐ Vicinity Map
- ☐ Site Map and Grading Plan
- ☐ Basin Map
- ☐ Storm Plan and Profile
- ☐ Erosion Control Plan
- ☐ Detail Sheets

Appendix C

Hydraulic Analysis Worksheet

Appendix C Hydraulic Analysis Worksheet

Provide the following information for all projects, as applicable.

Name/Project: Foss Waterway Park - Phase 1

Address 2011 East D Street Tacoma WA 98402

Parcel Number 8950001761 Permit Number: _____

Watershed: Foss Waterway

WWHM or Continuous Models Input

Model files must be provided electronically. Include both on-site and off-site quantities.

Amount of new impervious (square feet): 18733

Amount of replaced impervious (square feet): 15892

Amount of new plus replaced (square feet): 34625

Amount of land disturbed (square feet): 65092

Native vegetation to lawn/landscaped (acres): Ø

Native vegetation to pasture (acres): Ø

Value of proposed improvements ($): _____

Assessed value of existing site improvements ($): _____

Amount to be graded/filled (cubic feet): _____

Existing impervious: 19611 sf

Amount of new pgis (square feet): 34625

Amount of existing pgis (square feet): 19611

Amount of new pgs (square feet): Ø

Amount of existing pgs (square feet): Ø

SBUH Input

Rainfall Type: _____

Hydraulic Method: _____

Hydraulic Interval: _____

Peak Factor: _____

Tp Factor: _____

Complete the following tables for sub-basins tributary to the project site (on-site and off-site).

Pre-Developed Conditions

Sub-basin Name	Acreage	Land Use/ Ground Cover*	Hydrologic Soil Group*	Curve Number
Existing	0.45	Pavement	C	0.90
	1.04	Lawns	C	0.25
Pre-developed	1.49	Forest	C	0.10

* Where more than one land use or soil group are present within a sub-basin, a line item must be shown for each to support calculation of the composite pervious and impervious Curve Numbers.

Developed Conditions

Sub-basin Name	Acreage	Land Use/ Ground Cover*	Hydrologic Soil Group*	Curve Number

* Where more than one land use or soil group are present within a sub-basin, a line item must be shown for each to support calculation of the composite pervious and impervious Curve Numbers.

Provide pervious and impervious Tc data for each sub-basin including the flow path shown on an attached figure.

Flow Control Facilities – N/A

For the flow control facility, provide the following:

- Bottom length: _____
- Bottom width: _____
- Side slopes: _____
- Stage/ Storage Table with units: _____

For the control structure, provide the following:

- Outlet pipe size: _____
- Orifice elevation: _____ Diameter: _____
- Orifice elevation: _____ Diameter: _____
- Orifice elevation: _____ Diameter: _____
- Riser elevation: _____ Diameter: _____
- V-notch weir data (alternate): _____

Western Washington Hydrology Model
PROJECT REPORT

Project Name: Foss Waterway Park
Site Address: 2011 East D Street
City : Tacoma
Report Date : 10/27/2011
Gage : McMillin
Data Start : 10/01/1948
Data End : 09/30/1996
Precip Scale: 1.00
WWHM3 Version: 1.0

PREDEVELOPED LAND USE

Name : Predeveloped
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C, Forest, Flat	1.494

Impervious Land Use	Acres

Element Flows To:
Surface Interflow Groundwater

DEVELOPED LAND USE

Name : Developed
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C, Lawn, Flat	0.397

Impervious Land Use	Acres
DRIVEWAYS FLAT	0.458
PARKING FLAT	0.639

Element Flows To:
Surface Interflow Groundwater

MITIGATED LAND USE

ANALYSIS RESULTS

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.032332
5 year	0.051918
10 year	0.065435
25 year	0.082756
50 year	0.095696
100 year	0.108593

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.335338
5 year	0.454616
10 year	0.540182
25 year	0.656022
50 year	0.748070
100 year	0.845167

Yearly Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1950	0.044	0.270
1951	0.037	0.358
1952	0.076	0.465
1953	0.019	0.196
1954	0.021	0.385
1955	0.028	0.343
1956	0.026	0.234
1957	0.051	0.297
1958	0.020	0.706
1959	0.021	0.277
1960	0.029	0.290
1961	0.118	0.954
1962	0.041	0.285
1963	0.012	0.248
1964	0.078	0.614
1965	0.038	0.294
1966	0.036	0.442
1967	0.075	0.487
1968	0.041	0.302
1969	0.022	0.408
1970	0.028	0.569
1971	0.019	0.261
1972	0.030	0.287
1973	0.051	0.283
1974	0.018	0.343
1975	0.052	0.526
1976	0.037	0.238
1977	0.032	0.321
1978	0.006	0.193
1979	0.061	0.455
1980	0.039	0.439
1981	0.054	0.320
1982	0.029	0.490
1983	0.044	0.343

Year	Predeveloped	Mitigated
1984	0.023	0.481
1985	0.011	0.307
1986	0.017	0.192
1987	0.036	0.316
1988	0.083	0.448
1989	0.025	0.356
1990	0.021	0.350
1991	0.044	0.235
1992	0.040	0.421
1993	0.023	0.275
1994	0.046	0.242
1995	0.014	0.200
1996	0.011	0.431
1997	0.043	0.345

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.1178	0.9542
2	0.0835	0.7060
3	0.0781	0.6139
4	0.0756	0.5692
5	0.0746	0.5263
6	0.0614	0.4897
7	0.0536	0.4869
8	0.0520	0.4814
9	0.0509	0.4648
10	0.0507	0.4546
11	0.0464	0.4485
12	0.0443	0.4425
13	0.0442	0.4387
14	0.0438	0.4309
15	0.0428	0.4209
16	0.0415	0.4081
17	0.0414	0.3848
18	0.0400	0.3576
19	0.0395	0.3565
20	0.0375	0.3501
21	0.0369	0.3446
22	0.0365	0.3432
23	0.0357	0.3430
24	0.0355	0.3430
25	0.0320	0.3213
26	0.0304	0.3203
27	0.0288	0.3160
28	0.0285	0.3072
29	0.0284	0.3023
30	0.0275	0.2970
31	0.0260	0.2942
32	0.0251	0.2896
33	0.0227	0.2871
34	0.0226	0.2847
35	0.0221	0.2833
36	0.0214	0.2768
37	0.0213	0.2748
38	0.0210	0.2695

Rank	Predeveloped	Mitigated
39	0.0199	0.2614
40	0.0193	0.2482
41	0.0192	0.2415
42	0.0183	0.2382
43	0.0168	0.2350
44	0.0145	0.2340
45	0.0123	0.2004
46	0.0114	0.1962
47	0.0109	0.1935
48	0.0056	0.1920

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Western Washington Hydrology Model
PROJECT REPORT

Project Name: Foss Waterway Park
Site Address: 2011 East D Street
City : Tacoma
Report Date : 10/27/2011
Gage : McMillin
Data Start : 10/01/1948
Data End : 09/30/1996
Precip Scale: 1.00
WWHM3 Version: 1.0

PREDEVELOPED LAND USE

Name : Existing
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C, Lawn, Flat	1.044

Impervious Land Use	Acres
DRIVEWAYS FLAT	0.358
PARKING FLAT	0.092

Element Flows To:

Surface	Interflow	Groundwater

DEVELOPED LAND USE

Name : Developed
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C, Lawn, Flat	0.397

Impervious Land Use	Acres
DRIVEWAYS FLAT	0.458
PARKING FLAT	0.639

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

ANALYSIS RESULTS

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.183796
5 year	0.265606
10 year	0.327231
25 year	0.413947
50 year	0.485219
100 year	0.562423

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.335338
5 year	0.454616
10 year	0.540182
25 year	0.656022
50 year	0.748070
100 year	0.845167

Yearly Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1950	0.157	0.270
1951	0.201	0.358
1952	0.322	0.465
1953	0.086	0.196
1954	0.220	0.385
1955	0.202	0.343
1956	0.116	0.234
1957	0.148	0.297
1958	0.330	0.706
1959	0.146	0.277
1960	0.155	0.290
1961	0.666	0.954
1962	0.164	0.285
1963	0.136	0.248
1964	0.450	0.614
1965	0.162	0.294
1966	0.188	0.442
1967	0.369	0.487
1968	0.175	0.302
1969	0.207	0.408
1970	0.243	0.569
1971	0.135	0.261
1972	0.160	0.287
1973	0.147	0.283
1974	0.169	0.343
1975	0.375	0.526
1976	0.123	0.238
1977	0.214	0.321
1978	0.086	0.193
1979	0.332	0.455
1980	0.225	0.439
1981	0.192	0.320

Year	Predeveloped	Mitigated
1982	0.314	0.490
1983	0.176	0.343
1984	0.256	0.481
1985	0.152	0.307
1986	0.095	0.192
1987	0.179	0.316
1988	0.227	0.448
1989	0.192	0.356
1990	0.208	0.350
1991	0.141	0.235
1992	0.235	0.421
1993	0.143	0.275
1994	0.146	0.242
1995	0.099	0.200
1996	0.187	0.431
1997	0.201	0.345

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.6659	0.9542
2	0.4498	0.7060
3	0.3746	0.6139
4	0.3687	0.5692
5	0.3325	0.5263
6	0.3303	0.4897
7	0.3222	0.4869
8	0.3135	0.4814
9	0.2558	0.4648
10	0.2433	0.4546
11	0.2354	0.4485
12	0.2268	0.4425
13	0.2247	0.4387
14	0.2204	0.4309
15	0.2141	0.4209
16	0.2084	0.4081
17	0.2070	0.3848
18	0.2017	0.3576
19	0.2008	0.3565
20	0.2005	0.3501
21	0.1924	0.3446
22	0.1917	0.3432
23	0.1882	0.3430
24	0.1870	0.3430
25	0.1788	0.3213
26	0.1759	0.3203
27	0.1752	0.3160
28	0.1687	0.3072
29	0.1642	0.3023
30	0.1618	0.2970
31	0.1597	0.2942
32	0.1571	0.2896
33	0.1550	0.2871
34	0.1523	0.2847
35	0.1485	0.2833
36	0.1471	0.2768

Rank	Predeveloped	Mitigated
37	0.1463	0.2748
38	0.1461	0.2695
39	0.1434	0.2614
40	0.1411	0.2482
41	0.1359	0.2415
42	0.1354	0.2382
43	0.1230	0.2350
44	0.1160	0.2340
45	0.0990	0.2004
46	0.0950	0.1962
47	0.0862	0.1935
48	0.0855	0.1920

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8" Diameter Pipe - 25-yr Storm

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.012		Ductile Iron
Channel Slope	0.00500	ft/ft	
Diameter	0.67	ft	8" Ø
Discharge	0.41	ft³/s	Q_{25} - see WQ calculations

Results

Normal Depth	0.31	ft
Flow Area	0.16	ft²
Wetted Perimeter	1.00	ft
Top Width	0.67	ft
Critical Depth	0.30	ft
Percent Full	46.1	%
Critical Slope	0.00574	ft/ft
Velocity	2.57	ft/s
Velocity Head	0.10	ft
Specific Energy	0.41	ft
Froude Number	0.93	
Maximum Discharge	1.01	ft³/s
Discharge Full	0.94	ft³/s
Slope Full	0.00094	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	46.08	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s

8" Diameter Pipe - 25-yr Storm

GVF Output Data

Normal Depth	0.31	ft
Critical Depth	0.30	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00574	ft/ft

8" Diameter Pipe - 100-yr Storm

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.012		Ductile Iron
Channel Slope	0.00500	ft/ft	
Diameter	0.67	ft	8"Ø
Discharge	0.52	ft³/s	Q_{100} – See WQ calculations

Results

Normal Depth	0.36	ft
Flow Area	0.19	ft²
Wetted Perimeter	1.09	ft
Top Width	0.67	ft
Critical Depth	0.34	ft
Percent Full	53.1	%
Critical Slope	0.00600	ft/ft
Velocity	2.73	ft/s
Velocity Head	0.12	ft
Specific Energy	0.47	ft
Froude Number	0.90	
Maximum Discharge	1.01	ft³/s
Discharge Full	0.94	ft³/s
Slope Full	0.00153	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	53.08	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s

8" Diameter Pipe - 100-yr Storm

GVF Output Data

Normal Depth	0.36	ft
Critical Depth	0.34	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00600	ft/ft

Appendix D

Operations and Maintenance Manual

The Foss Waterway Park – Phase 1 project proposes to demolish an existing asphalt drive and cap the contaminated soils on site and rebuild a new asphalt drive and gravel parking area. Utility improvements include a new storm drain system that will collect runoff from the asphalt and gravel areas and convey it to a treatment facility before discharging it to an existing stormwater conveyance system in East D Street. The site is located at 2110 East D Street in Tacoma, Washington.

Stormwater runoff from pollution generating surfaces onsite will be collected in a catch basin and treated prior to discharge from the site. Stormwater will be discharged to an existing stormwater facility in East D Street that directly discharges to the Foss Waterway of Puget Sound. Stormwater from the non-pollution generating impervious surfaces will continue to sheet flow to the Foss Waterway of Puget Sound.

Operations and maintenance will be the responsibility of the Owner, Foss Waterway Development Authority. Mr. Su Dowie is the main contact person at Foss Waterway Development Authority. His contact information is as follows:

Mr. Su Dowie
535 East Dock Street, Suite 204
Tacoma, WA 98402
Phone: (253) 597-8122

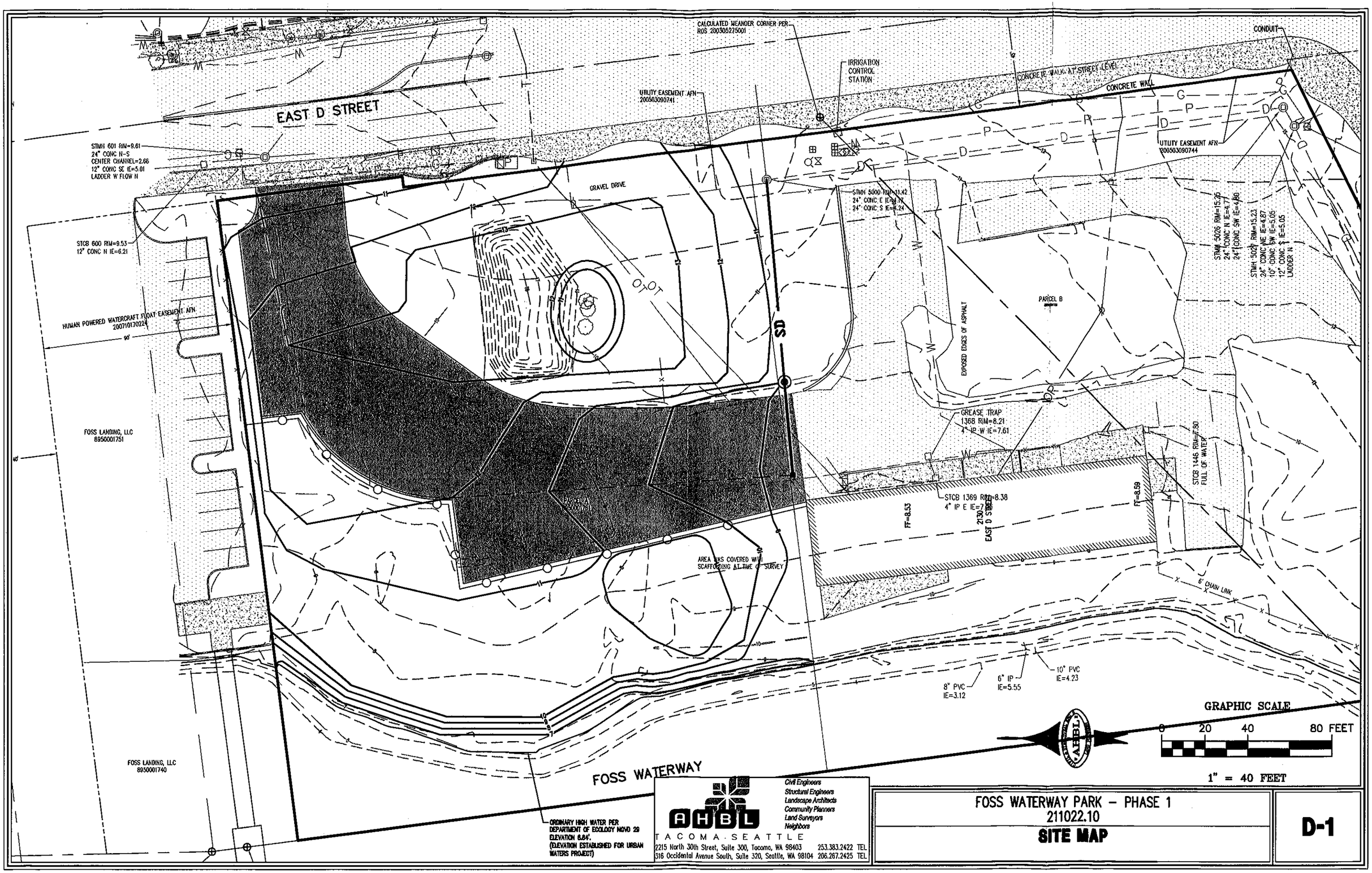
The Operations and Maintenance Manual shall be kept onsite at all times at the Foss Waterway Development Authority office.

Any standing water removed during the maintenance operation must be disposed of in a City-approved manner, and residuals must be disposed of in accordance with state and local solid waste regulations. A Special Approval Discharge (SAD) Permit may be required for disposal of water. Please contact Source Control at (253) 502-2159 to discuss the SAD Permit.

Table 1 below shows the schedule of maintenance for the stormwater drainage system.

Table 1: Schedule of Maintenance

Structure	**Insp./Maint. Schedule**	**Condition when maintenance is needed**	**Result expected when maintenance is performed**
Catch Basin	Yearly	Clean structure of all sediments within the sump.	Sumps shall contain no sediment.
Contech StormFilter	Yearly	Sediment exceeds 6 inches. Drawdown of water through the media takes longer than 1 hour, and/or overflow occurs.	No sediment in bottom of structure. Media cartridge replaced.
Storm Drainage Pipes	Yearly	Yearly, insert high pressure hose into the upstream end of the pipe. Wash pipe of all sediment and remove from the sump of the downstream structure.	



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316 Occidental Avenue South, Suite 320, Seattle, WA 98104 206.267.2425 TEL

FOSS WATERWAY PARK – PHASE 1
211022.10

SITE MAP

D-1

No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is performed
General	Trash & Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%.	No Trash or debris located immediately in front of catch basin or on grate opening.
		Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe.	No trash or debris in the catch basin.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Inlet and outlet pipes free of trash or debris.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the catch basin.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the catch basin
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch (Intent is to make sure no material is running into basin).	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Frame is sitting flush on the riser rings or top slab and firmly attached.
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound.	Basin replaced or repaired to design standards.
		Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Pipe is regrouted and secure at basin wall.
	Settlement/ Misalignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the basin opening.	No vegetation blocking opening to basin.
		Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation or root growth present.

No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
General	Contamination and Pollution	See "Detention Ponds" (No. 1).	No pollution present.
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Catch basin cover is closed
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. (Intent is keep cover from sealing off access to maintenance.)	Cover can be removed by one maintenance person.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
Metal Grates (If Applicable)	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

No. 6 – Debris Barriers (e.g., Trash Racks)

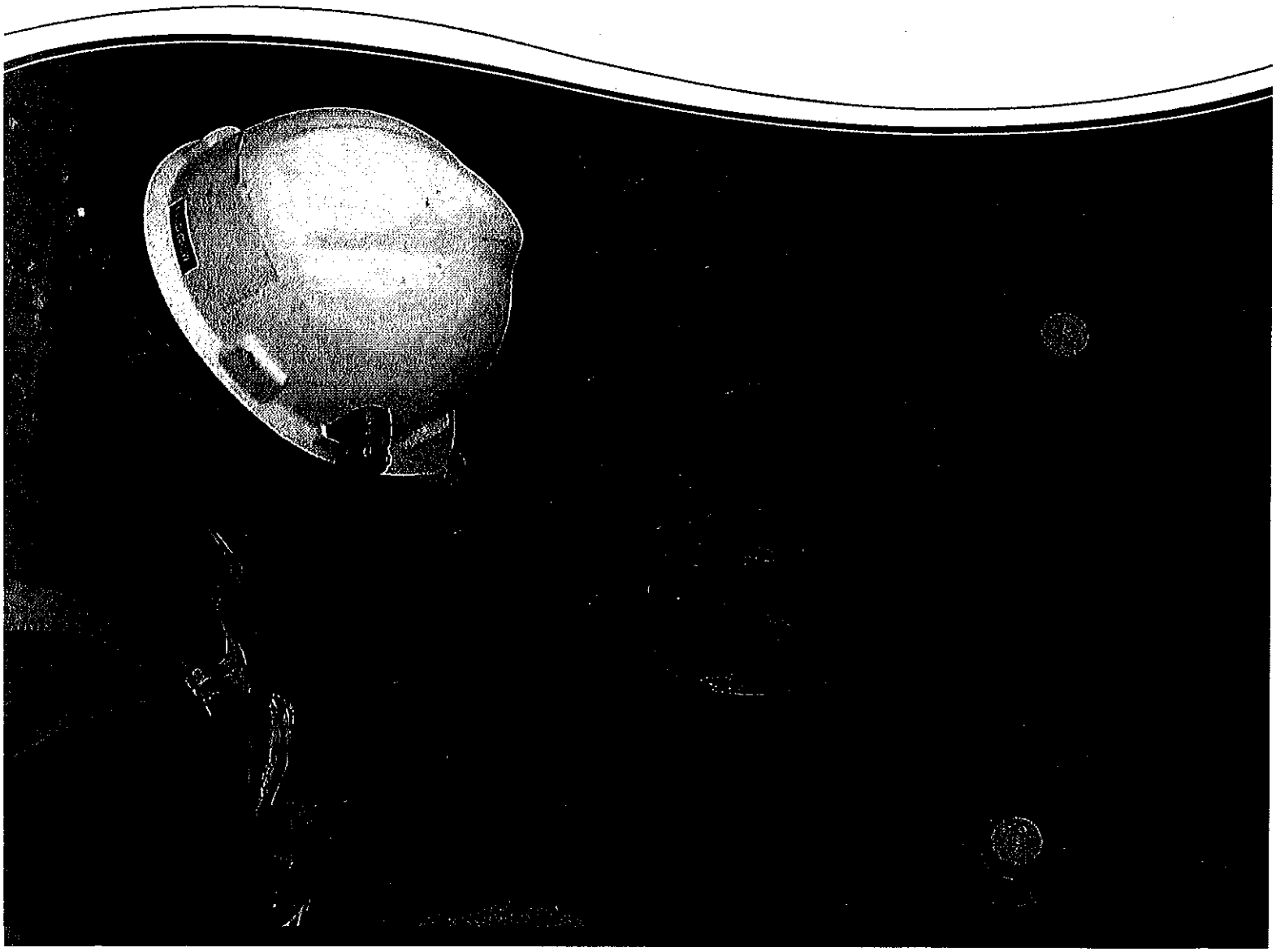
Maintenance Components	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Trash and Debris	Trash or debris that is plugging more than 20% of the openings in the barrier.	Barrier cleared to design flow capacity.
Metal	Damaged/ Missing Bars.	Bars are bent out of shape more than 3 inches.	Bars in place with no bends more than 3/4 inch.
		Bars are missing or entire barrier missing.	Bars in place according to design.
		Bars are loose and rust is causing 50% deterioration to any part of barrier.	Barrier replaced or repaired to design standards.
	Inlet/Outlet Pipe	Debris barrier missing or not attached to pipe	Barrier firmly attached to pipe

No. 15 – STORMFILTER™

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Below Ground Vault	Sediment Accumulation on Media.	Sediment depth exceeds 0.25-inches.	No sediment deposits which would impede permeability of the compost media.
	Sediment Accumulation in Vault	Sediment depth exceeds 6-inches in first chamber.	No sediment deposits in vault bottom of first chamber.
	Trash/Debris Accumulation	Trash and debris accumulated on compost filter bed.	Trash and debris removed from the compost filter bed.
	Sediment in Drain Pipes/Clean-Outs	When drain pipes, clean-outs, become full with sediment and/or debris.	Sediment and debris removed.
	Damaged Pipes	Any part of the pipes that are crushed or damaged due to corrosion and/or settlement.	Pipe repaired and/or replaced.
	Access Cover Damaged/Not Working	Cover cannot be opened; one person cannot open the cover using normal lifting pressure, corrosion/deformation of cover.	Cover repaired to proper working specifications or replaced.
	Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab	Cracks wider than 1/2-inch or evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determine that the vault is not structurally sound.	Vault replaced or repairs made so that vault meets design specifications and is structurally sound.
		Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.	Vault repaired so that no cracks exist wider than 1/4-inch at the joint of the inlet/outlet pipe.
	Baffles	Baffles corroding, cracking warping, and/or showing signs of failure as determined by maintenance/inspection person.	Baffles repaired or replaced to specifications.
	Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks, and misaligned.	Ladder replaced or repaired and meets specifications, and is safe to use as determined by inspection personnel.
Below Ground Cartridge Type	[redacted] Media	Drawdown of water through the media takes longer than 1 hour, and/or overflow occurs frequently.	Media cartridges replaced.
	Short Circuiting	Flows do not properly enter filter cartridges.	Filter cartridges replaced.

CONTECH
CONSTRUCTION PRODUCTS INC.

StormFilter Inspection and Maintenance Procedures



The Stormwater Management StormFilter®

Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter out and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the StormFilter to its full efficiency and effectiveness.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is a good practice to inspect the system after major storm events.

Maintenance Procedures

Although there are likely many effective maintenance options, we believe the following procedure is efficient and can be implemented using common equipment and existing maintenance protocols. A two step procedure is recommended as follows:

1. Inspection

Inspection of the vault interior to determine the need for maintenance.

2. Maintenance

Cartridge replacement

Sediment removal

Inspection and Maintenance Timing

At least one scheduled inspection should take place per year with maintenance following as warranted.

First, an inspection should be done before the winter season. During the inspection the need for maintenance should be determined and, if disposal during maintenance will be required, samples of the accumulated sediments and media should be obtained.

Second, if warranted, a maintenance (replacement of the filter cartridges and removal of accumulated sediments) should be performed during periods of dry weather.



In addition to these two activities, it is important to check the condition of the StormFilter unit after major storms for potential damage caused by high flows and for high sediment accumulation that may be caused by localized erosion in the drainage area. It may be necessary to adjust the inspection/ maintenance schedule depending on the actual operating conditions encountered by the system. In general, inspection activities can be conducted at any time, and maintenance should occur, if warranted, in late summer to early fall when flows into the system are not likely to be present.

Maintenance Frequency

The primary factor controlling timing of maintenance of the StormFilter is sediment loading.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media inside the cartridges. The flow through the system will naturally decrease as more and more particulates are trapped. Eventually the flow through the cartridges will be low enough to require replacement. It may be possible to extend the usable span of the cartridges by removing sediment from upstream trapping devices on a routine as-needed basis in order to prevent material from being re-suspended and discharged to the StormFilter treatment system.

Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction may need to be inspected and maintained more often than those with fully stabilized surface conditions.

The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after major storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual StormFilter system or site. It is recommended that the site owner develop a database to properly manage StormFilter inspection and maintenance programs.

Prior to the development of the maintenance database, the following maintenance frequencies should be followed:

Inspection

One time per year

After major storms

Maintenance

As needed, based on results of inspection (The average maintenance lifecycle is approximately 1-3 years)

Per Regulatory requirement

In the event of a chemical spill

Frequencies should be updated as required. The recommended initial frequency for inspection is one time per year. StormFilter units should be inspected after major storms.

Sediment removal and cartridge replacement on an as needed basis is recommended unless site conditions warrant.

Once an understanding of site characteristics has been established, maintenance may not be needed for one to three years, but inspection is warranted and recommended annually.

Inspection Procedures

The primary goal of an inspection is to assess the condition of the cartridges relative to the level of visual sediment loading as it relates to decreased treatment capacity. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, then typically large amounts of sediments will be present and very little flow will be discharged from the drainage pipes. If this is the case, then maintenance is warranted and the cartridges need to be replaced.

Warning: In the case of a spill, the worker should abort inspection activities until the proper guidance is obtained. Notify the local hazard control agency and CONTECH Construction Products immediately.

To conduct an inspection:

Important: Inspection should be performed by a person who is familiar with the operation and configuration of the StormFilter treatment unit.

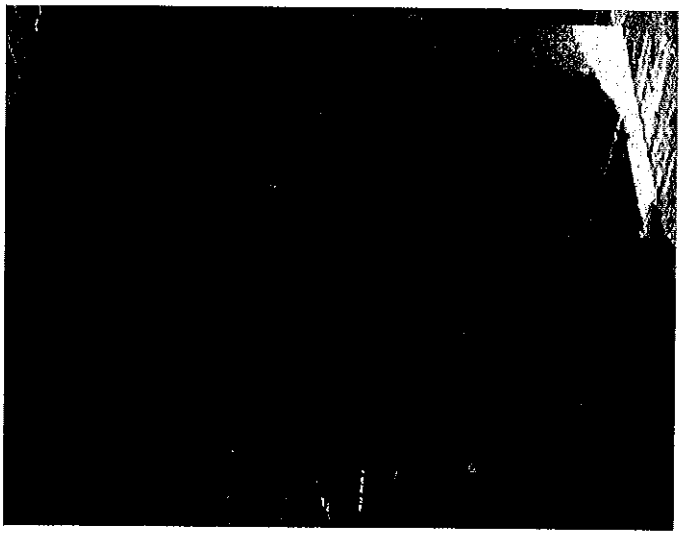
1. If applicable, set up safety equipment to protect and notify surrounding vehicle and pedestrian traffic.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.



3. Open the access portals to the vault and allow the system vent.
4. Without entering the vault, visually inspect the inside of the unit, and note accumulations of liquids and solids.
5. Be sure to record the level of sediment build-up on the floor of the vault, in the forebay, and on top of the cartridges. If flow is occurring, note the flow of water per drainage pipe. Record all observations. Digital pictures are valuable for historical documentation.
6. Close and fasten the access portals.
7. Remove safety equipment.
8. If appropriate, make notes about the local drainage area relative to ongoing construction, erosion problems, or high loading of other materials to the system.
9. Discuss conditions that suggest maintenance and make decision as to weather or not maintenance is needed.

Maintenance Decision Tree

The need for maintenance is typically based on results of the inspection. The following Maintenance Decision Tree should be used as a general guide. (Other factors, such as Regulatory Requirements, may need to be considered)



1. Sediment loading on the vault floor.
   a. If >4" of accumulated sediment, maintenance is required.
2. Sediment loading on top of the cartridge.
   a. If >1/4" of accumulation, maintenance is required.
3. Submerged cartridges.
   a. If >4" of static water in the cartridge bay for more that 24 hours after end of rain event, maintenance is required.
4. Plugged media.
   a. If pore space between media granules is absent, maintenance is required.
5. Bypass condition.
   a. If inspection is conducted during an average rain fall event and StormFilter remains in bypass condition (water over the internal outlet baffle wall or submerged cartridges), maintenance is required.
6. Hazardous material release.
   a. If hazardous material release (automotive fluids or other) is reported, maintenance is required.
7. Pronounced scum line.
   a. If pronounced scum line (say ≥ 1/4" thick) is present above top cap, maintenance is required.
8. Calendar Lifecycle.
   a. If system has not been maintained for 3 years maintenance is required.

Assumptions

- No rainfall for 24 hours or more
- No upstream detention (at least not draining into StormFilter)
- Structure is online
- Outlet pipe is clear of obstruction
- Construction bypass is plugged

Maintenance

Depending on the configuration of the particular system, maintenance personnel will be required to enter the vault to perform the maintenance.

Important: If vault entry is required, OSHA rules for confined space entry must be followed.

Filter cartridge replacement should occur during dry weather. It may be necessary to plug the filter inlet pipe if base flows is occurring.

Replacement cartridges can be delivered to the site or customers facility. Information concerning how to obtain the replacement cartridges is available from CONTECH Construction Products.

Warning: In the case of a spill, the maintenance personnel should abort maintenance activities until the proper guidance is obtained. Notify the local hazard control agency and CONTECH Construction Products immediately.

To conduct cartridge replacement and sediment removal maintenance:

1. If applicable, set up safety equipment to protect maintenance personnel and pedestrians from site hazards.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the doors (access portals) to the vault and allow the system to vent.
4. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
5. Make notes about the external and internal condition of the vault. Give particular attention to recording the level of sediment build-up on the floor of the vault, in the forebay, and on top of the internal components.
6. Using appropriate equipment offload the replacement cartridges (up to 150 lbs. each) and set aside.
7. Remove used cartridges from the vault using one of the following methods:

Method 1:

A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Unscrew (counterclockwise rotations) each filter cartridge from the underdrain connector. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

Using appropriate hoisting equipment, attach a cable from the boom, crane, or tripod to the loose cartridge. Contact CONTECH Construction Products for suggested attachment devices.



Important: Note that cartridges containing perlear media (CSF) do not require unscrewing from their connectors, take care not to damage the manifold connectors, this connector should remain installed in the manifold and could be capped during the maintenance activity to prevent sediments from entering the underdrain manifold.

B. Remove the used cartridges (up to 250 lbs. each) from the vault.

Important: Care must be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner unless CONTECH Construction Products performs the maintenance activities and damage is not related to discharges to the system.

C. Set the used cartridge aside or load onto the hauling truck.

D. Continue steps a through c until all cartridges have been removed.

Method 2:

A. Enter the vault using appropriate confined space protocols.

B. Unscrew the cartridge cap.

C. Remove the cartridge hood screws (3) hood and float.

D. At location under structure access, tip the cartridge on its side.

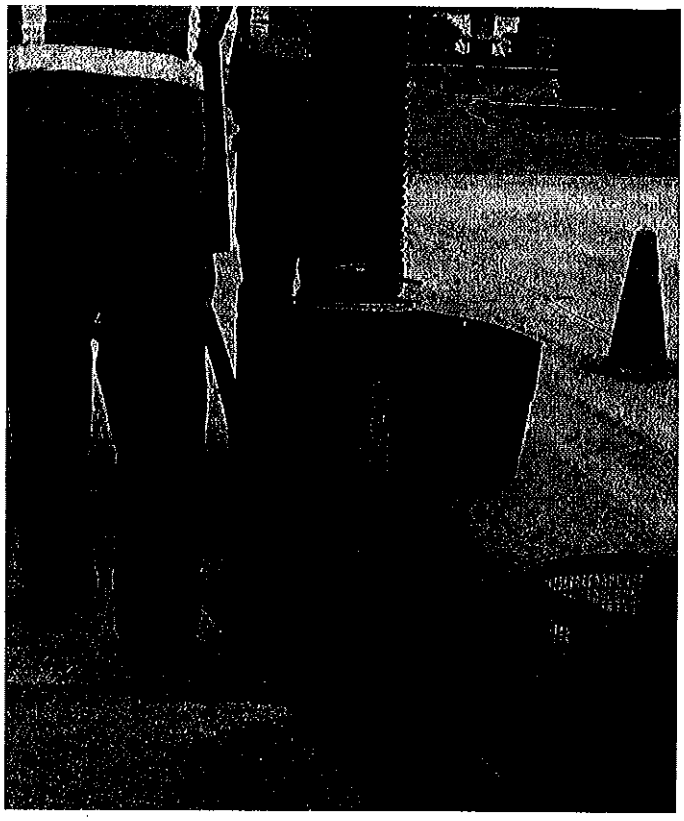
Important: Note that cartridges containing media other than the leaf media require unscrewing from their threaded connectors. Take care not to damage the manifold connectors. This connector should remain installed in the manifold and capped if necessary.

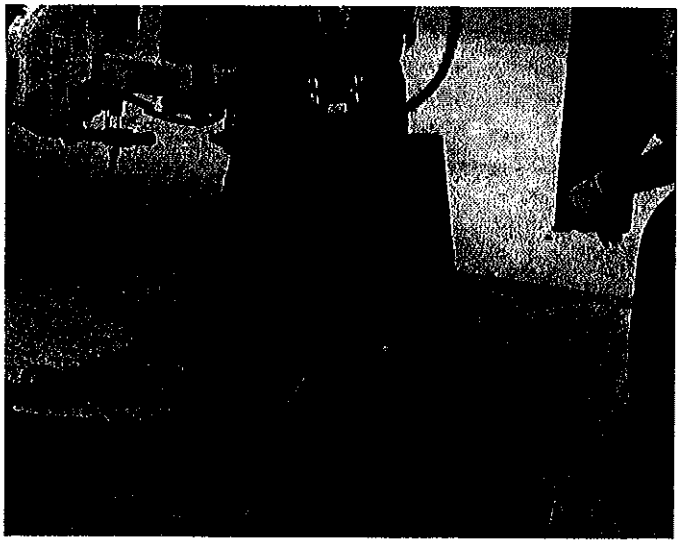
D. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.

E. Set the empty, used cartridge aside or load onto the hauling truck.

F. ,Continue steps a through e until all cartridges have been removed.







8. Remove accumulated sediment from the floor of the vault and from the forebay. This can most effectively be accomplished by use of a vacuum truck.
9. Once the sediments are removed, assess the condition of the vault and the condition of the connectors. The connectors are short sections of 2-inch schedule 40 PVC, or threaded schedule 80 PVC that should protrude about 1" above the floor of the vault. Lightly wash down the vault interior.
   a. Replace any damaged connectors.
10. Using the vacuum truck boom, crane, or tripod, lower and install the new cartridges. Once again, take care not to damage connections.
11. Close and fasten the door.
12. Remove safety equipment.
13. Finally, dispose of the accumulated materials in accordance with applicable regulations. Make arrangements to return the used empty cartridges to CONTECH Construction Products.

Related Maintenance Activities -

Performed on an as-needed basis

StormFilter units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads.

Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

RECYCLED PAPER

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Support

- Drawings and specifications are available at contechstormwater.com.
- Site-specific design support is available from our engineers.

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CONTECH Construction Products Inc. provides site solutions for the civil engineering industry. CONTECH's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other CONTECH division offerings, visit contech-cpi.com or call 800.338.1122

Nothing in this catalog should be construed as an expressed warranty or an implied warranty of merchantability or fitness for any particular purpose. See the CONTECH standard quotation or acknowledgement for applicable warranties and other terms and conditions of sale.

The product(s) described may be protected by one or more of the following US patents: 5,322,629; 5,624,576; 5,707,527; 5,759,415; 5,788,848; 5,985,157; 6,027,639; 6,350,374; 6,406,218; 6,641,720; 6,511,595; 6,649,048; 6,991,114; 6,998,038; 7,186,058; related foreign patents or other patents pending.

Inspection Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

Sediment Thickness in Forebay: _____ Date: _____

Sediment Depth on Vault Floor: _____

Structural Damage: _____

Estimated Flow from Drainage Pipes (if available): _____

Cartridges Submerged: Yes ☐ No ☐ Depth of Standing Water: _____

StormFilter Maintenance Activities (check off if done and give description)

☐ Trash and Debris Removal: _____

☐ Minor Structural Repairs: _____

☐ Drainage Area Report _____

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

Items Needing Further Work: _____

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

_____

_____

_____

_____

_____

_____

_____

_____

Review the condition reports from the previous inspection visits.

StormFilter Maintenance Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

List Safety Procedures and Equipment Used: _____

_____

_____

System Observations

Months in Service:

Oil in Forebay: Yes ☐ No ☐

Sediment Depth in Forebay: _____

Sediment Depth on Vault Floor: _____

Structural Damage: _____

Drainage Area Report

Excessive Oil Loading: Yes ☐ No ☐ Source: _____

Sediment Accumulation on Pavement: Yes ☐ No ☐ Source: _____

Erosion of Landscaped Areas: Yes ☐ No ☐ Source: _____

StormFilter Cartridge Replacement Maintenance Activities

Remove Trash and Debris: Yes ☐ No ☐ Details: _____

Replace Cartridges: Yes ☐ No ☐ Details: _____

Sediment Removed: Yes ☐ No ☐ Details: _____

Quantity of Sediment Removed (estimate?):

Minor Structural Repairs: Yes ☐ No ☐ Details: _____

Residuals (debris, sediment) Disposal Methods: _____

Notes:

_____

_____

_____

_____

_____

_____

_____

Appendix E

Construction Stormwater Pollution Prevention Plan

Prepared by GeoEngineers, Inc.

Appendix F

Bond Quantity Worksheet

SITE IMPROVEMENT BOND QUANTITY WORKSHEET				
Item	Quantity	Unit	Unit Price	Amount
EROSION/SEDIMENT CONTROL				
Backfill & compaction-embankment		CY		
Check dams, 4" minus rock		Each		
Crushed surfacing 1-1/4" minus		CY		
Ditching		CY		
Excavation-bulk		CY		
Fence, silt		LF		
Fence, Temporary (NGPE)		LF		
Hydroseeding		SY		
Jute Mesh		SY		
Mulch, by hand, straw, 3" deep		SY		
Mulch, by machine, straw, 2" deep		SY		
Piping, temporary, CPP, 6"		LF		
Piping, temporary, CPP, 8"		LF		
Piping, temporary, CPP, 12"		LF		
Plastic covering, 6mm thick, sandbagged		SY		
Rip Rap, machine placed; slopes		CY		
Rock Construction Entrance, 50'x15'x1'		Each		
Rock Construction Entrance, 100'x15'x1'		Each		
Sediment pond riser assembly		Each		
Sediment trap, 5' high berm		LF		
Sed. Trap, 5' high, raprapped spillway berm section		LF		
Seeding, by hand		SY		
Sodding, 1" deep, level ground		SY		
Sodding, 1" deep, sloped ground		SY		
TESC Supervisor		HR		
Water truck, dust control		HR		
GENERAL ITEMS				
Backfill & Compaction-embankment		CY		
Backfill & Compaction-trench		CY		
Clear/Remove Brush, by hand		SY		
Clearing/Grubbing/Tree Removal		Acre		
Excavation-bulk		CY		
Excavation-trench		CY		
Fencing, cedar, 6' high		LF		
Fencing, chain link, gate, vinyl coated, 6' high		LF		
Fencing, chain link, gate, vinyl coated, 20'		Each		
Fencing, split rail, 3' high		LF		

SITE IMPROVEMENT BOND QUANTITY WORKSHEET				
Item	Quantity	Units	Unit Price	Amount
Fill & compact - common barrow		CY		
Fill & compact - gravel base		CY		
Fill & compact - screened topsoil		CY		
Gabion, 12" deep, stone-filled mesh		SY		
Gabion, 18" deep, stone-filled mesh		SY		
Gabion, 36" deep, stone-filled mesh		SY		
Grading, fine, by hand		SY		
Grading, fine, with grader		SY		
Monuments, 3' long		Each		
Sensitive Areas Sign		Each		
Sodding, 1" deep, sloped ground		SY		
Surveying, line & grade		Day		
Surveying, lot location/lines		Acre		
Traffic control crew (2 flaggers)		HR		
Trail, 4" chipped wood		SY		
Trail, 4" crushed cinder		SY		
Trail, 4" top course		SY		
Wall, retaining concrete		SF		
Wall, rockery		SF		
ROAD IMPROVEMENT				
AC Grinding, 4' wide machine <1000sy		SY		
AC Grinding, 4' wide machine 1000-2000sy		SY		
AC Grinding, 4' wide machine >2000sy		SY		
AC Removal/Disposal/Repair		SY		
Barricade, type I		LF		
Barricade, type III (Permanent)		LF		
Curb and Gutter, rolled		LF		
Curb and Gutter, vertical		LF		
Curb and Gutter, demolition and disposal		LF		
Curb, extruded asphalt		LF		
Curb, extruded concrete		LF		
Sawcut, asphalt, 3" depth		LF		
Sawcut, concrete, per 1" depth		LF		
Sealant, asphalt		LF		
Shoulder, AC, (see AC road unit price)		SY		
Shoulder, gravel, 4" thick		SY		
Sidewalk, 4" thick		SY		
Sidewalk, 4" thick, demolition and disposal		SY		
Sidewalk, 5" thck		SY		

SITE IMPROVEMENT BOND QUANTITY WORKSHEET				
Item	Quantity	Unit	Unit Price	Amount
Sidewalk, 5" thick, demolition and disposal		SY		
Sign, handicap		Each		
Striping, per stall		Each		
Striping, thermoplastic, (for crosswalk)		SF		
Striping, 4" reflectorized line		LF		
ROAD SURFACING (4" Rock = 2.5" base & 1.5" top course) For '93 KCRS (6.5" Rock = 5" base & 1.5" top course)				
For KCRS '93, (additional 2.5" base) add:		SY		
AC Overlay, 1.5" AC		SY		
AC Overlay, 2" AC		SY		
AC Road, 2", 4" rock, First 2500 SY		SY		
AC Road, 2", 4" rock, Qty. over 2500 SY		SY		
AC Road, 3", 4" rock, First 2500 SY		SY		
AC Road, 3", 4" rock, Qty. over 2500 SY		SY		
AC Road, 5", First 2500 SY		SY		
AC Road, 5", Qty. over 2500 SY		SY		
AC Road, 6", First 2500 SY		Sy		
AC Road, 6", Qty. over 2500 SY		SY		
Asphalt Treated Base, 4" thick		SY		
Gravel Road, 4" rock, First 2500 SY		SY		
Gravel Road, 4" rock, Qty. over 2500 SY		SY		
PCC Road, 5", no base, over 2500 SY		SY		
PCC Road, 6", no base, over 2500 SY		SY		
Thickened Edge		LF		
DRAINAGE (CPP = Corrugated Plastic Pipe, N12 or equivalent).For Culvert prices, average of 4' cover was assumed. Assume perforated PVC is same price as solid pipe.				
Access Road, R/D		SY		
Bollards - fixed		Each		
Bollards - removable		Each		
*(CBs include frame and lid)				
CB Type I		Each		
CB Type IL		Each		
CB Type II, 48" diameter		Each		
for additional depth over 4'		FT		
CB Type II, 54" diameter		Each		
for additional depth over 4'		FT		
CB Type II, 60" diameter		Each		
for additional depth over 4'		FT		
CB Type II, 72" diameter		Each		
for additional depth over 4'		FT		

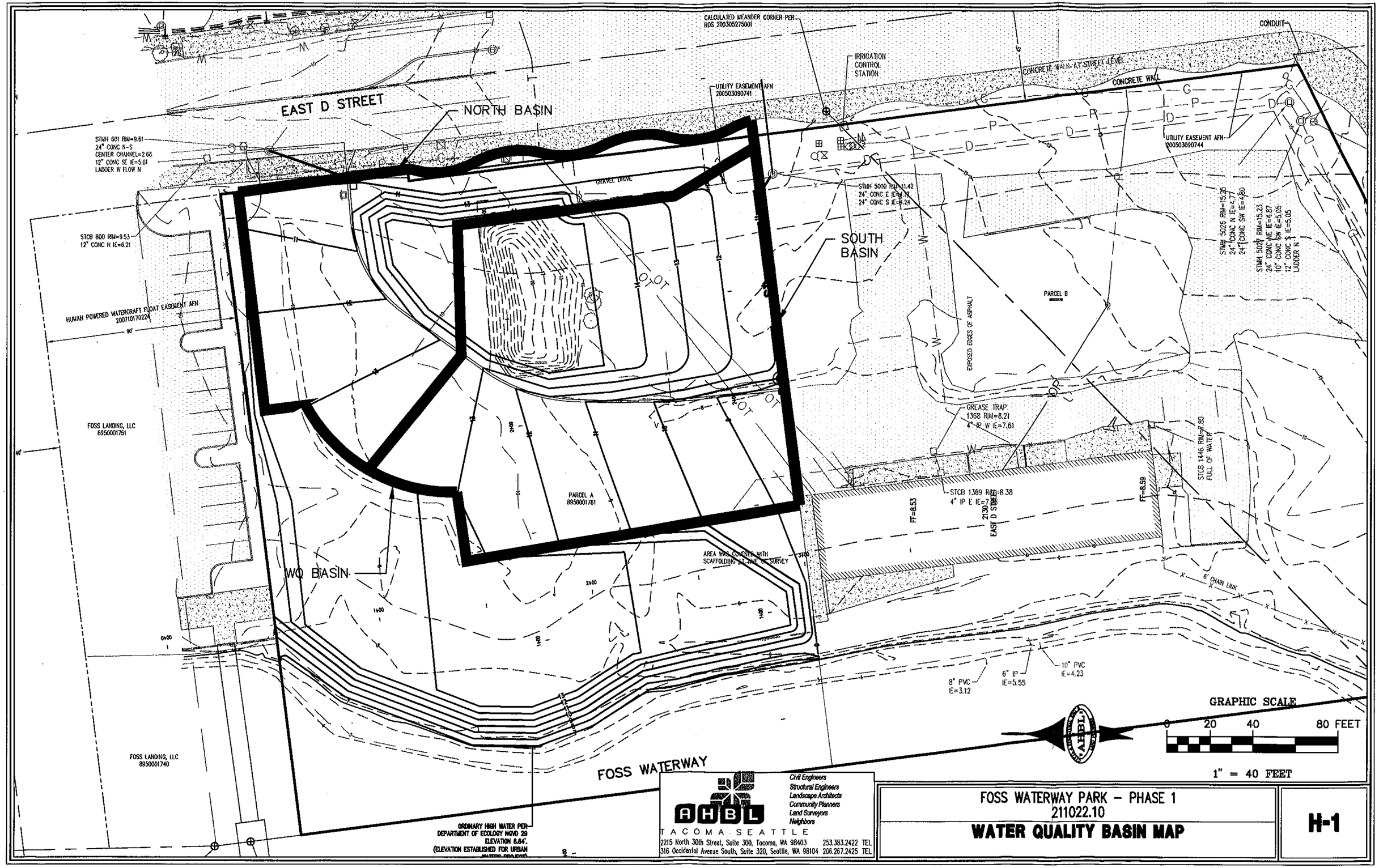
Appendix G

Final Draft
Cleanup Action Plan for the Former American Plating Inc.

Prepared by GeoEngineers, Inc., November 24, 2003

Appendix H

Water Quality Calculations



AHBL
TACOMA · SEATTLE
Civil Engineers
Structural Engineers
Landscape Architects
Community Planners
Land Surveyors
Neighbors
2215 North 30th Street, Suite 300, Tacoma, WA 98403 253.383.2422 TEL
316 Occidental Avenue South, Suite 320, Seattle, WA 98104 206.267.2425 TEL

FOSS WATERWAY PARK – PHASE 1
211022.10

WATER QUALITY BASIN MAP

H-1

Western Washington Hydrology Model
PROJECT REPORT

Project Name: Foss Waterway Park - Phase 1
Site Address: 2110 East D Street
City : Tacoma
Report Date : 12/19/2011
Gage : McMillin
Data Start : 10/01/1948
Data End : 09/30/1996
Precip Scale: 1.00
WWHM3 Version: 1.0

DEVELOPED LAND USE

Name : North Water Quality Basin (WQ_N)
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C, Lawn, Flat	0.086

Impervious Land Use	Acres
DRIVEWAYS FLAT	0.220
PARKING FLAT	0.027

Element Flows To:
Surface Interflow Groundwater

MITIGATED LAND USE

ANALYSIS RESULTS

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.075334
5 year	0.102071
10 year	0.121242
25 year	0.147188
50 year	0.167798
100 year	0.189534

Water Quality BMP Flow and Volume for POC 1.
On-line facility volume: 0.0292 acre-feet
On-line facility target flow: 0.01 cfs.
Adjusted for 15 min: 0.037 cfs.
Off-line facility target flow: 0.0196 cfs.
Adjusted for 15 min: 0.0215 cfs.

This program and accompanying documentation is provided 'as-is' without warranty of any kind. The entire risk regarding the performance and results of this program is assumed by the user. Clear Creek Solutions and the Washington State Department of Ecology disclaims all warranties, either expressed or implied, including but not limited to implied warranties of program and accompanying documentation. In no event shall Clear Creek Solutions and/or the Washington State Department of Ecology be liable for any damages whatsoever (including without limitation to damages for loss of business profits, loss of business information, business interruption, and the like) arising out of the use of, or inability to use this program even if Clear Creek Solutions or the Washington State Department of Ecology has been advised of the possibility of such damages.

Q:\2011\211022\10_CIV\NON_CAD\CALCS\North Water Quality WWHM3.docx

$$N_{cart} = Q_{WQ} * \frac{449\ gpm/cfs}{7.5\ gmp/cart} = 0.037 * \frac{449}{7.5} = 2.21 \rightarrow \textbf{3 cartridges}$$

Western Washington Hydrology Model
PROJECT REPORT

Project Name: Foss Waterway Park - Phase 1
Site Address: 2110 East D Street
City : Tacoma
Report Date : 12/19/2011
Gage : McMillin
Data Start : 10/01/1948
Data End : 09/30/1996
Precip Scale: 1.00
WWHM3 Version: 1.0

DEVELOPED LAND USE

Name : South Water Quality Basin (WQ_S)
Bypass: No

GroundWater: No

Pervious Land Use	Acres

Impervious Land Use	Acres
DRIVEWAYS FLAT	0.266
PARKING FLAT	0.303

Element Flows To:
Surface Interflow Groundwater

MITIGATED LAND USE

ANALYSIS RESULTS

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.163558
5 year	0.218333
10 year	0.257164
25 year	0.309245
50 year	0.350291
100 year	0.393312

Water Quality BMP Flow and Volume for POC 1.
On-line facility volume: 0.0626 acre-feet
On-line facility target flow: 0.01 cfs.
Adjusted for 15 min: 0.088 cfs.
Off-line facility target flow: 0.0455 cfs.
Adjusted for 15 min: 0.0514 cfs.

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$$N_{cart} = Q_{WQ} * \frac{449\ gpm/cfs}{7.5\ gmp/cart} = 0.088 * \frac{449}{7.5} = 5.27 \rightarrow \textbf{6 cartridges}$$

Appendix I

Worksheet for Commercial and Industrial Activities

Chapter 2 Worksheet for Commercial and Industrial Activities

This worksheet is designed for use by business and industry operators. Complete the entire worksheet by checking the appropriate boxes for all activities that take place at the work site. If any of the activities as being performed outdoors, use the activity code on the worksheet to find the recommended BMPs contained in Chapter 4.

Activity Code (BMP)	TYPE OF ACTIVITY	Are you involved in this? If so, check if it occurs:	
		Indoors[1]	Outdoors[2]
SECTION A1 – CLEANING AND WASHING ACTIVITIES			
A101	Cleaning or Washing of Tools, Engines, and Manufacturing Equipment – includes parts washers and all types of manufactured equipment components.		
A102	Cleaning or Washing of Cooking Equipment – includes vents, filters, pots and pans, grills, and related items.		
A103	Washing, Pressure Washing, and Steam Cleaning of Vehicles/Equipment/Building Structures – covers cleaning and washing at all types of establishments, including fleet vehicle yards, car dealerships, car washes, and maintenance facilities.		
A104	Collection and Disposal of Wastewater from Mobile Interior Washing Operations – includes carpet cleaners, upholstery cleaners, and drapery cleaners.		
SECTION A2 – TRANSFERS OF LIQUID OR SOLID MATERIALS			
A201	Loading and Unloading Areas for Liquid or Solid Material – for loading and unloading of materials at industrial and commercial facilities		
A202	Fueling at Dedicated Stations – includes gas stations, pumps at fleet vehicle yards or shops, and other privately owned pumps.		
A203	Vehicle Maintenance Activities – covers oil changes and other engine fluids.		
A204	Mobile Fueling of Vehicles and Heavy Equipment – includes fleet fueling, wet fueling, and wet hosing		

SECTION A3 – PRODUCTION AND APPLICATION ACTIVITIES			
A301	Concrete and Asphalt Mixing and Production at Stationary Sites – applies to mixing of raw materials on-site to produce concrete or asphalt.		
A302	Concrete Pouring, Concrete Cutting, and Asphalt Application at Temporary Sites – includes construction sites, and driveway and parking lot resurfacing.		
A303	Manufacturing and Post-processing of Metal Products – includes machining, grinding, soldering, cutting, welding, quenching, rinsing, etc.		
A304	Wood Treatment Areas – includes wood treatment using pressure processes or by dipping or spraying.		
A305	Commercial Composting – includes commercial composting facilities operating outside.		
A306	Landscaping and Lawn/Vegetation Maintenance, Including Vegetation Removal, Herbicide and Insecticide Application, Fertilizer Application, Irrigation, Watering, Gardening, and Lawn Care – includes businesses involved in landscaping, applying pesticides and managing vegetation.		
A307	Painting, Finishing, and Coating of Vehicles, Boats, Buildings, and Equipment – includes surface preparation and the applications of paints, finishes, and/or coatings.		
A308	Commercial Printing Operations – includes materials used in the printing process.		
A309	Manufacturing Activities (Outside) - includes outdoor manufacturing areas.		
SECTION A4 – STORAGE ACTIVITIES			
A401	Storage or Transfer (Outside) of Solid Raw Materials, By-products, or Finished Products		
A402	Storage and Treatment of Contaminated Soils – applies to contaminated soils that are excavated and left on-site.		X
A403	Temporary Storage or Processing of Fruits or Vegetables – includes processing activities at wineries, fresh and frozen juice makers, and other food and beverage processing operations.		
A404	Storage of Solid Wastes and Food Wastes – includes regular garbage and all other discarded non-liquid items.		
A405	Recyclers and Scrap Yards – includes scrapped equipment, vehicles, empty metal drums, and assorted recyclables.		

A406	Treatment, Storage, or Disposal of Dangerous Wastes – Refer to Ecology and the Tacoma-Pierce County Health Department for more information, see Chapter 6.		
A407	Storage of Liquid, Food Waste, or Dangerous Waste Containers – includes containers located outside a building and used for temporary storage		
A408	Storage of Liquids in Permanent Above-ground Tanks – includes all liquids in above-ground tanks		
A409	Parking and Storage for Vehicles and Equipment – includes public and commercial parking lots		X
SECTION A5 – CONSTRUCTION ACTIVITIES			
A501	Clearing, Grading, and Preparation of Construction Sites – applies to land developing activities and to residential yard clearing and grading projects.		X
A502	Demolition of Buildings – applies to removal of existing buildings and subsequent clearing of the rubble.		
A503	Building Repair, Remodeling, and Construction – applies to construction of buildings, general exterior building repair work and remodeling of buildings.		
SECTION A6 – DUST CONTROL AND SOIL AND SEDIMENT CONTROL			
A601	Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots		X
A602	Dust Control at Manufacturing Sites – includes grain dust, sawdust, coal, gravel, crushed rock, cement, and boiler fly ash.		
A603	Soil Erosion and Sediment Control at Industrial Sites – includes industrial activities that take place on soil.		X
SECTION A7 – OTHER ACTIVITIES			
A701	Commercial Animal Handling Areas – includes kennels, fenced pens, veterinarians, and businesses that board animals		
A702	Log Sorting and Handling – applies to log yards typically located at sawmills, ports, and pulp mills.		
A703	Boat building, Mooring, Maintenance, and Repair – includes all types of maintenance, repair, and building operations.		
A704	Logging – applies to logging activities that fall under Class IV general forest practices.		
A705	Mining and Quarrying of Sand, Gravel, Minerals, Peat, Clay, Rock, and Other Materials – does not include excavation at construction sites.		

A706	Swimming Pool and Spa Cleaning and Maintenance – includes every swimming pool and spa not at a single family residence. Commercial pool cleaners are included here for all pools.		
A707	Deicing and Anti-icing Operations for Airports and Streets - includes aircraft, runways/taxiways, streets and highways.		
A708	Roof and Building Drains at Manufacturing and Commercial Buildings – These sites will be referred to the Puget Sound Clean Air Agency.		
A709	Urban Streets – includes recommended BMPs.		
A710	Railroad Yards		
A711	Maintenance of Public and Private Utility Corridors and Facilities – includes public and private utility maintenance activities.		X
A712	Maintenance of Roadside Ditches		
A713	Maintenance of Stormwater Drainage and Treatment Facilities		X
A714	Spills of Oil and Hazardous Substances		
A715	Water Reservoir, Transmission Mainline, Wellhead, and Hydrant Flushing Activities		
SECTION S1 – SOURCE CONTROL BMPs			
S101	Eliminate Illicit Sewer to Storm Drainage System Connections		
S102	Dispose of Contaminated Stormwater and Waste Materials Properly		X
S103	Discharge Process Wastewater to a Sanitary Sewer, Holding Tank, or Water Treatment System		X
S104	Cover the Activity with a Roof of Awning		
S105	Cover the Activity with an Anchored Tarp or Plastic Sheet		
S106	Pave the Activity Area and Slope to a Sump or Holding Tank, or Oil/Water Generator		
S107	Surround the Activity Area with a Curb, Dike, or Berm or Elevate the Activity		
S108	Implement Integrated Pest Management Measures		
S109	Cleaning Catch Basins		X

[1] If any of these activities occur indoors, then BMPs are not required, provided no indoor drains or processes can ultimately contact stormwater or be transported to surface waters such as rivers, lakes and streams. Ensure that liquids, powders, dusts and fine granular materials stay confined indoors. Otherwise BMPs will be required.

[2] If any of these activities occur outdoors, then use the activity code to find the appropriate BMPs described in Chapter 4.

4.5.2 BMP A402: Storage and Treatment of Contaminated Soils

4.5.2.1 Description of Pollutant Sources

This activity applies to businesses and agencies that store and treat soils contaminated with toxic organic compounds, petroleum products, or heavy metals. Stormwater runoff that comes in contact with contaminated soil can carry those contaminants along with loose dirt into receiving waters.

4.5.2.2 Pollutant Control Approach

The Tacoma-Pierce County Health Department Waste Management Section (at 253-798-6047) regulates and permits businesses disposing and treating contaminated soil. A permit from the Puget Sound Clean Air Agency is required if the treatment method for removing soil contaminants involves forcing air through, or sucking air from, the soil. In addition, a Special Approved Discharge Authorization from the City of Tacoma may be required if potentially contaminated water is to be discharged from the site. The Puget Sound Clean Air Agency can be reached at 800-552-3565. Contact the City of Tacoma Source Control Unit at 253-591-5588.

4.5.2.3 Required BMPs

The BMPs included here are intended as a supplement to other regulations. The following BMPs or equivalent measures are required of all businesses engaged in storage and treatment of contaminated soils:

- The storage area for contaminated soils must be enclosed indoors, covered, or contained by a curb, dike, or berm constructed around the material storage area. If the contaminated soils are covered, stormwater run-on protection must also be provided. BMP S107 provides further details on containment and run-on prevention.
- Employees must be educated on methods to prevent contamination from leaving the site.
- Cleanup materials must be stocked near the storage area.
- Gutters, storm drains, catch basins, and other drainage system features on the site must be cleaned following the completion of site work, or at least once per year, whichever comes first. Sediments from such cleaning must be disposed of properly. See BMP S109 and S102 for details on catch basin cleaning and disposal options.

4.5.2.4 Recommended BMPs

The following BMPs are not required but can provide additional pollution protection:

- If feasible, the storage area should be swept weekly for collection of stray soil, which can be added back to the piles or properly disposed. See BMP S102 for information on disposal options.
- Implement one of the following treatment BMPs in conjunction with a runoff containment plan:
  - Vegetated biofilter.
  - Equivalent BMP for the targeted pollutant (see Volume 5).

The use of any treatment BMP must not result in the violation of groundwater, surface water, wastewater, or drinking water quality standards.

4.5.9 BMP A409: Parking and Storage for Vehicles and Equipment

4.5.9.1 Description of Pollutant Sources

Parked vehicles at public and commercial parking lots and garages, such as retail store, fleet vehicle (including rent-a-car lots and car dealerships), equipment sale and rental parking lots, and parking lot driveways, can be sources of toxic hydrocarbons and other organic compounds, oils and greases, metals, and suspended solids.

4.5.9.2 Required BMPs

- If washing of a parking lot is conducted, discharge the washwater to a sanitary sewer (if allowed by the City of Tacoma) or other approved wastewater treatment system, or collect it for off-site disposal.
- Do not hose down the area to a storm drain or receiving water. Sweep (vacuum sweeping is preferred) parking lots, storage areas, and driveways regularly to collect dirt, waste, and debris.
- An oil removal system such as an API or CP oil and water separator, catch basin filter, or equivalent BMP (see Volume 5), approved by the City of Tacoma, is applicable for parking lots meeting the threshold vehicle traffic intensity level of a high-use site. For more information on high-use sites, refer to Volume 5, Chapter 1.
- Covered floors of parking garages must drain to the sanitary sewer through an approved oil/water separator. Uncovered floors must be routed to the storm drainage system through an approved treatment device.

4.6 Construction and Demolition Activities

4.6.1 BMP A501: Clearing, Grading and Preparation of Construction Sites

This activity applies to businesses and municipal agencies that develop lands for construction. It also applies to residences that undertake large yard clearing and grading projects. Stormwater runoff from bare ground can be loaded with dirt and other pollutants. This material can clog ditches and stream channels, thus reducing carrying capacity and increasing flooding, as well as smothering spawning beds for fish. Simply controlling runoff and not allowing it to leave the site will prevent these harmful effects. Clearing, grading, and preparation activities are covered in detail in Volume 2 of this manual, Construction Stormwater Pollution Prevention. Grading activities are also regulated in the City of Tacoma by the Grading and Excavation Code, Section 2.02.330 TMC.

Control of stormwater run-on and soil stabilization is critical. Limiting the area to be cleared and graded during wet weather seasons will make site stabilization and sediment control easier.

Coverage under Ecology's Construction Stormwater General Permit is required for construction sites that result in the disturbance of one acre or more of land. Compliance with the Construction Stormwater Pollution Prevention requirements in Ecology's manual is required, as applicable.

4.7 Dust Control, and Soil and Sediment Control

4.7.1 BMP A601: Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots

4.7.1.1 Description of Pollutant Sources

Dust can cause air and water pollution problems particularly at demolition sites, disturbed land areas, and unpaved roadways and parking lots.

4.7.1.2 Pollutant Control Approach

Minimize dust generation and apply environmentally friendly and government approved dust suppressant chemicals, if necessary.

4.7.1.3 Required BMPs

- Sprinkle or wet down soil or dust with water as long as it does not result in runoff or a wastewater discharge. Minimize the amount of water to avoid washing pollutants into the storm drainage system. At active construction sites, street sweeping shall be performed prior to washing the street.
- Use only local and/or state government approved dust suppressant chemicals such as those listed in Ecology Publication #96-433, "Techniques for Dust Prevention and Suppression." See BMP C126, Polyacrylamide for Soil Erosion Protection, in Volume 2, Chapter 3 of this manual.
- Avoid excessive and repeated applications of dust suppressant chemicals. Time the application of dust suppressants to avoid or minimize their wash-off by rainfall or human activity such as irrigation.
- Use stormwater containment to prevent the conveyance of solids by stormwater into storm drains or receiving waters.
- The use of motor oil or other oils for dust control is prohibited. Care shall be taken when using lignin derivatives and other high BOD chemicals in excavations or areas easily accessible to surface water or groundwater.
- Consult with the Ecology Southwest Regional Office at 360-407-6300 on discharge permit requirements if the dust suppression process results in a wastewater discharge to the ground, groundwater, storm drain, or surface water.

4.7.1.4 Recommended BMPs for Roadways and Other Trafficked Areas:

- Consider limiting use of off-road recreational vehicles on dust generating land.
- Consider paving unpaved permanent roads, approaches, exits, access lanes, and other trafficked areas at municipal, commercial, and industrial areas.
- Consider paving or stabilizing shoulders of paved roads with gravel, vegetation, or City of Tacoma approved chemicals.
- Encourage use of alternate paved routes, if available.

- Vacuum or wet sweep fine dirt and skid control materials from paved roads soon after winter weather ends or as needed.
- Consider using traction sand that is pre-washed to reduce dust emissions.

4.7.1.5 Recommended BMPs for Dust Generating Areas:

- Prepare a dust control plan. Helpful references include: Control of Open Fugitive Dust Sources (EPA-450/3-88-088) and Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures (EPA-450/2-92-004).
- Limit exposure of soil (dust source) as much as feasible.
- Stabilize dust-generating soil by growing and maintaining vegetation, mulching, topsoiling, and/or applying stone, sand, or gravel.
- Apply windbreaks in the soil such as trees, board fences, tarp curtains, bales of hay, etc.
- Cover dust-generating piles with wind-impervious fabric, or equivalent material.

Additional information on dust control can be found in Volume 2 of this manual.

4.7.3 BMP A603: Soil Erosion and Sediment Control at Industrial Sites

4.7.3.1 Description of Pollutant Sources

Industrial activities on soil areas, exposed and disturbed soils, steep grades, etc. can be sources of sediments that can contaminate stormwater runoff.

4.7.3.2 Pollutant Control Approach

Limit the exposure of erodible soil, stabilize or cover erodible soil where necessary to prevent erosion, and/or provide treatment for stormwater contaminated with TSS caused by eroded soil.

4.7.3.3 Required BMPs

Apply one or more of the following cover practices:

- Vegetative cover such as grass, trees, large bark, bonded fiber matrix, or shrubs on erodible soil areas;
- Covering with mats such as clear plastic, jute, synthetic fiber; or gunite; and/or
- Preservation of natural vegetation including grass, trees, shrubs, and vines.

Control sediment through installing a vegetated swale, dike, silt fence, check dam, gravel filter berm, and/or sedimentation basin and properly grading. For design information refer to Volume 2.

4.8.11 BMP A711: Maintenance of Public and Utility Corridors and Facilities

4.8.11.1 Description of Pollutant Sources

Passageways and equipment at petroleum product, natural gas, and water pipelines and electrical power transmission corridors and rights-of-way can be sources of pollutants, such as herbicides used for vegetation management and eroded soil particles from unpaved access roads. At pump stations, waste materials generated during maintenance activities may be temporarily stored outside. Additional potential pollutant sources include the leaching of preservatives from wood utility poles, PCBs in older transformers, water that is removed from underground transformer vaults, and leaks/spills from petroleum pipelines. The following are potential pollutants: oil and grease, TSS, BOD, organics, PCB, pesticides, and heavy metals.

4.8.11.2 Pollutant Control Approach

Control fertilizer and pesticide applications, soil erosion, and site debris that can contaminate stormwater.

4.8.11.3 Required BMPs

- Implement BMPs included in Chapter 4, BMP A306: Landscaping and Lawn/Vegetation Management.
- When water or sediments are removed from electric transformer vaults, determine whether contaminants might be present before disposing of the water and sediments. This includes inspecting for the presence of oil or sheen, and determining from records or testing if the transformers contain PCBs. If records or tests indicate that the sediment or water are contaminated above applicable levels, manage these media in accordance with applicable federal and state regulations, including the federal PCB rules (40 CFR 761) and the state MTCA cleanup regulations (Chapter 173-340 WAC). Water removed from the vaults can be discharged in accordance with the federal 40 CFR 761.79, and state regulations (Chapter 173-201A WAC and Chapter 173-200 WAC), or via the sanitary sewer if the requirements, including applicable permits, for such a discharge are met. (See also Chapter 5).
- Within utility corridors, consider preparing maintenance procedures and an implementation schedule that provides for vegetative, gravel, or equivalent cover that minimizes bare or thinly vegetated ground surfaces within the corridor to prevent the erosion of soil. Pave high traffic corridors.
- Provide maintenance practices to prevent stormwater from accumulating and draining across and/or onto roadways. Stormwater shall be conveyed through roadside ditches and culverts. The road shall be crowned, outsloped, water barred, or otherwise left in a condition not conducive to erosion. Appropriately maintaining grassy roadside ditches discharging to surface waters is an effective way of removing some pollutants associated with sediments carried by stormwater.
- Maintain ditches and culverts at an appropriate frequency to ensure that plugging and flooding across the roadbed, with resulting overflow erosion, does not occur.
- Apply the appropriate BMPs from Volume 4 for the storage of waste materials that can contaminate stormwater.

4.8.11.4 Recommended BMPs

- When selecting utility poles for a specific location, consideration should be given to the potential environmental effects of the pole or poles during storage, handling, and end-use, as well as its cost, safety, efficacy, and expected life. If a wood product treated with chemical preservatives is used, it should be made in accordance with generally accepted industry standards such as the American Wood Preservers Association Standards. If the pole or poles will be placed in or near an environmentally sensitive area, such as a wetland or a drinking water well, alternative materials or technologies should be considered. These include poles constructed with material(s) other than wood, such as fiberglass composites, metal, or concrete. Other technologies and materials, such as sleeves or caissons for wood poles, may also be considered when they are determined to be practicable and available.
- Ring the base of treated poles with sorbent material if leaching of preservative may occur. Monitor the sorbents as needed.
- As soon as practicable, remove all litter from wire cutting/replacing operations, etc.
- Implement temporary erosion and sediment control in areas where clear-cuts are conducted and new roads are constructed.

4.8.13 BMP A713: Maintenance of Stormwater Drainage and Treatment Facilities

4.8.13.1 Description of Pollutant Sources

Facilities include roadside catch basins on arterials and within residential areas, conveyance systems, detention facilities such as ponds and vaults, oil and water separators, biofilters, settling basins, infiltration systems, and all other types of stormwater treatment systems presented in Volume 5. Roadside catch basins can remove from 5 to 15 percent of the pollutants present in stormwater. When catch basins are about 60 percent full of sediment, they cease removing sediments. Oil and grease, hydrocarbons, debris, heavy metals, sediments, and contaminated water are found in catch basins, oil and water separators, settling basins, etc.

4.8.13.2 Pollutant Control Approach

Provide maintenance and cleaning of debris, sediments, and oil from stormwater collection, conveyance, and treatment systems to obtain proper operation.

4.8.13.3 Required BMPs

Maintain stormwater treatment facilities according to the O & M procedures presented in Volume 1, Appendix D, in addition to the following BMPs:

- Inspect and clean treatment BMPs, conveyance systems, and catch basins as needed, and determine whether improvements in O & M are needed.
- Promptly repair any deterioration threatening the structural integrity of the facilities. These include replacement of clean-out gates, catch basin lids, and rock in emergency spillways.
- Ensure that storm sewer capacities are not exceeded and that heavy sediment discharges to the sewer system are prevented.
- Regularly remove debris and solids from BMPs used for peak-rate control, treatment, etc. and discharge to a sanitary sewer if approved by the City of Tacoma, or truck to a local or state government approved disposal site.
- Clean catch basins in accordance with the information provided in Volume 1, Appendix D. Additional information is also included in BMP S109: Cleaning Catch Basins.
- Clean debris in a catch basin as frequently as needed to ensure proper operation of the catch basin.
- Post warning signs or curb markers; "Dump No Waste - Drains to Groundwater," "Streams," "Lakes," or emboss on or adjacent to all storm drain inlets where practical.
- Disposal of sediments and liquids from the catch basins must comply with "Recommendations for Management of Street Wastes" described in Appendix D of this volume.

- Select additional applicable BMPs from Chapter 4 of this volume depending on the pollutant sources and activities conducted at the facility. Those BMPs include:
  - A407 Storage of Liquid, Food Waste, or Dangerous Waste Containers.
  - A603 Soil Erosion and Sediment Control at Industrial Sites
  - A709 Urban Streets
  - A714 Spills of Oil and Hazardous Substances
  - S101 Eliminate Illicit Storm Drainage System Connections

4.8.17 BMP S102: Dispose of Contaminated Stormwater and Waste Materials Properly

Every business and residence in Tacoma must dispose of solid and liquid wastes and contaminated stormwater properly. There are generally four options for disposal depending on the type of materials. These options include:

- Sanitary sewer and septic systems
- Recycling facilities
- Municipal or private, permitted solid waste disposal facilities
- Permitted hazardous waste treatment, storage, and disposal facilities

Many liquid wastes and contaminated stormwater (depending on the pollutants and associated concentrations present) can be put into the sanitary sewer. Animal wastes can also be disposed of in a sanitary sewer. A City permit may be required for discharges to the sanitary sewer system. Please contact the City Building and Land Use Department at 253-591-5030 and the Source Control Unit at 253-591-5588 for design and permit requirements.

If wastes cannot be legally discharged to a sanitary sewer or septic system, one of the other three disposal options must be used. Recycling facilities are a recommended option for many commercial and household items, including used oils, used batteries, old equipment, glass, some plastics, metal scrap materials, solvents, paints, wood and land clearing wastes, and various other solid wastes.

Solid wastes that cannot be recycled and that are not hazardous must be disposed of at a licensed municipal solid waste disposal facility. Dangerous and hazardous wastes must be properly transported to an appropriate hazardous waste treatment, storage, and disposal facility. The Tacoma-Pierce County Health Department Hazardous Waste section at 253-798-6470 can provide information on waste disposal options.

Maintain records for all materials that are recycled or disposed.

Appendix A of this volume has a list of telephone numbers to contact for assistance.

4.8.18 BMP S103: Discharge Process Wastewater to a Sanitary Sewer, Holding Tank, or Water Treatment System

This BMP is a minimum requirement for all industrial and commercial activities that generate contaminated process wastewater, such as washing activities, composting activities, and production and processing activities. The water used in these activities shall not drain to surface waters or groundwater untreated. Process water must drain to a sanitary sewer, holding tank, on-site treatment system, wastewater treatment system, or be recycled.

In order to connect to the sanitary sewer, contact Tacoma Building and Land Use Services at 253-591-5030 for information on sanitary sewer connection permits. Call the City of Tacoma Source Control Unit at 253-591-5588 for pretreatment and permit information.

If a sanitary sewer is not available, the only remaining options are holding tanks or an on-site wastewater treatment facility.

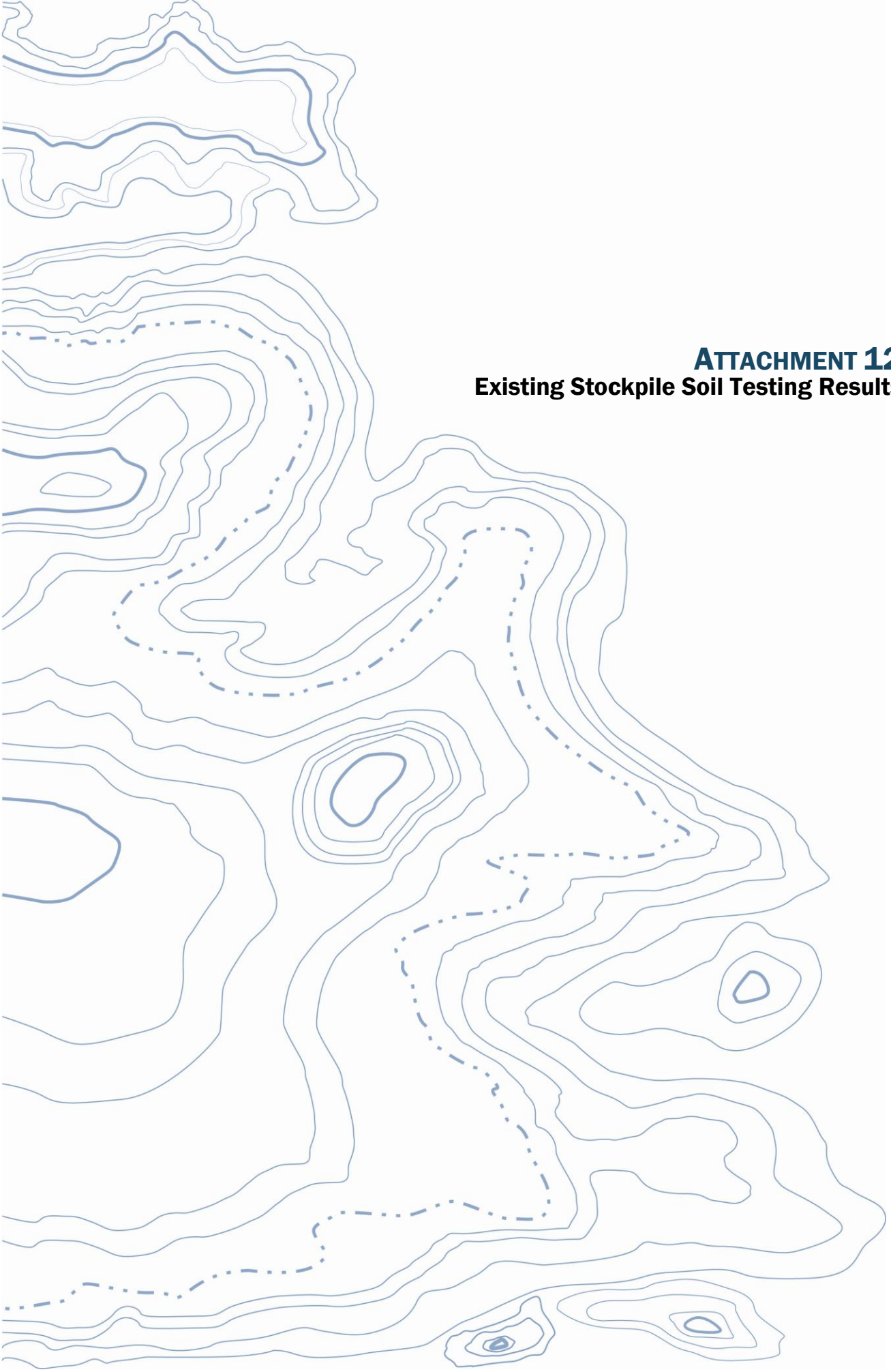
The contents of the holding tank must be pumped out or drained before the tank is full and disposed of properly (see BMP S102).

If the on-site wastewater treatment facility option is taken, then it must be designed to receive and effectively treat all discharges of process water from the business. The Washington State Department of Ecology must be contacted for approval of such a facility.

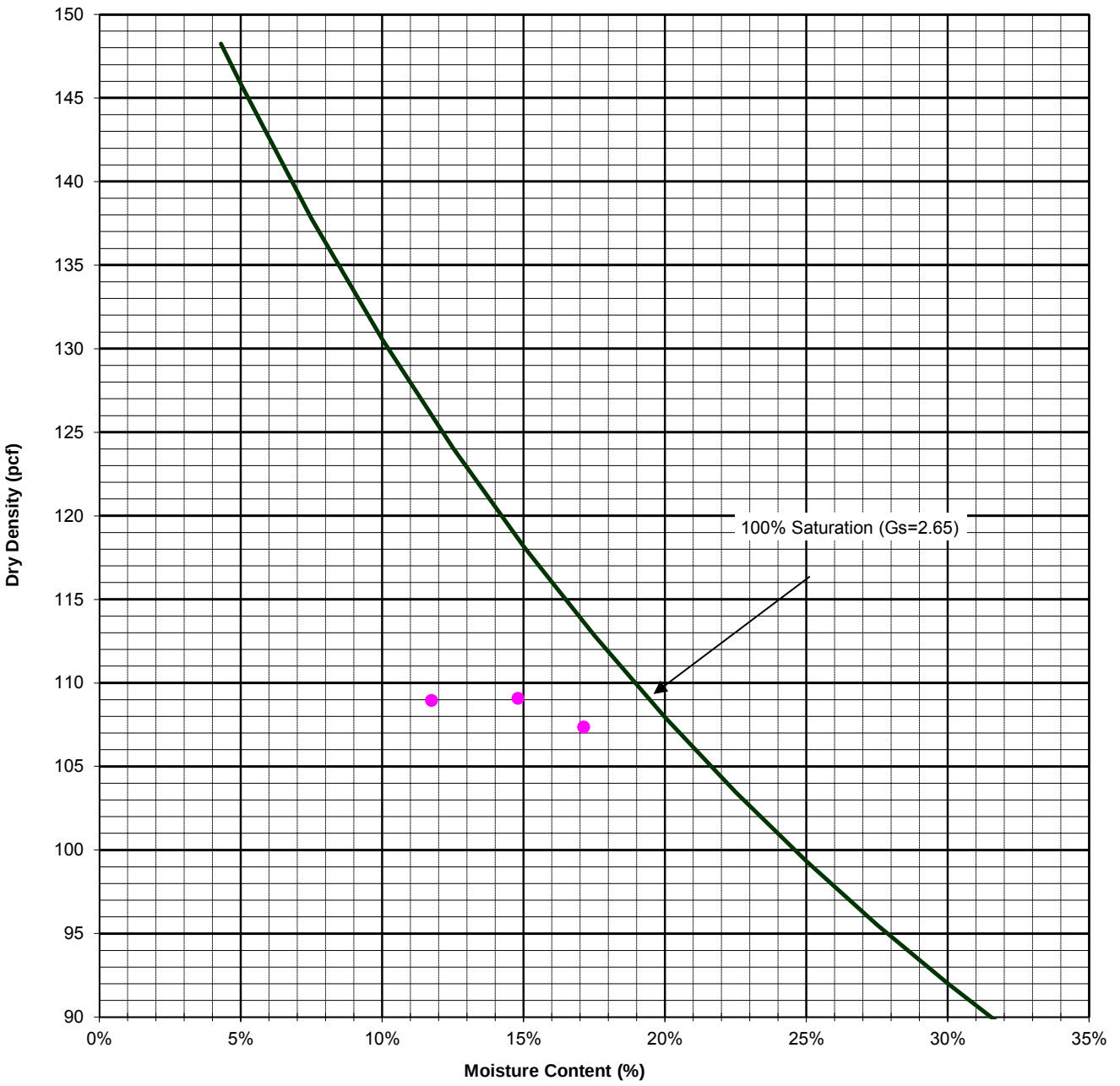
If the activity is to remain uncovered, then define a designated area for the activity and provide a mechanism for prevention of stormwater run-on into the activity area. (e.g. a curb, dike, or berm).The designated area shall be paved and sloped to a central collection drain and be connected to the sanitary sewer, (with pretreatment if required), the on-site holding tank, or the on-site treatment facility, whichever method is selected.

Monitoring and maintaining all collection systems and keeping records of inspections and maintenance may be required.

ATTACHMENT 12
Existing Stockpile Soil Testing Results



COMPACTION TEST SUMMARY



Point	1	2	3	4	Soil - Gravel
					Nat. MC
Mold + Moist Soil (lbs)	23.26	23.52	23.56		-
Mold Wt. (lbs)	14.13	14.13	14.13		-
Moist Soil (lbs)	9.13	9.39	9.43		-
Factor	0.075	0.075	0.075		-
Moist Density (pcf)	121.7	125.2	125.7		-
Pan + Moist Soil (g)	556.68	674.23	645.50		1208.10
Pan + Dry Soil (g)	506.98	598.11	563.35		1082.50
Moisture Loss (g)	49.7	76.12	82.15		125.6
Pan Tare (g)	84.24	84.21	83.83		232.86
Dry Soil (g)	422.74	513.9	479.52		849.64
Moisture Content (%)	11.8%	14.8%	17.1%		14.8%
Dry Density (pcf)	108.9	109.0	107.3		
Corr. Moisture (%)	-	-	-		
Corr. Dry Density (pcf)	-	-	-		
Comments		Max			

Job Name:	American Plating
Job Number:	10751-002-01
Exploration #:	STK-1
Sample #:	
Depth:	Grab

Date:	8/31/11
Tested by:	SAS

Soil Description:	Sandy silt (ML)

MDD (pcf)	**109.0**
OMC (%)	**14.8**

▲ = Corrected Values

● = Uncorrected Values

ASTM Test Method:			
☑ D 1557	☐ A	☐ B	☑ C
☐ D 698	☐ A	☐ B	☐ C

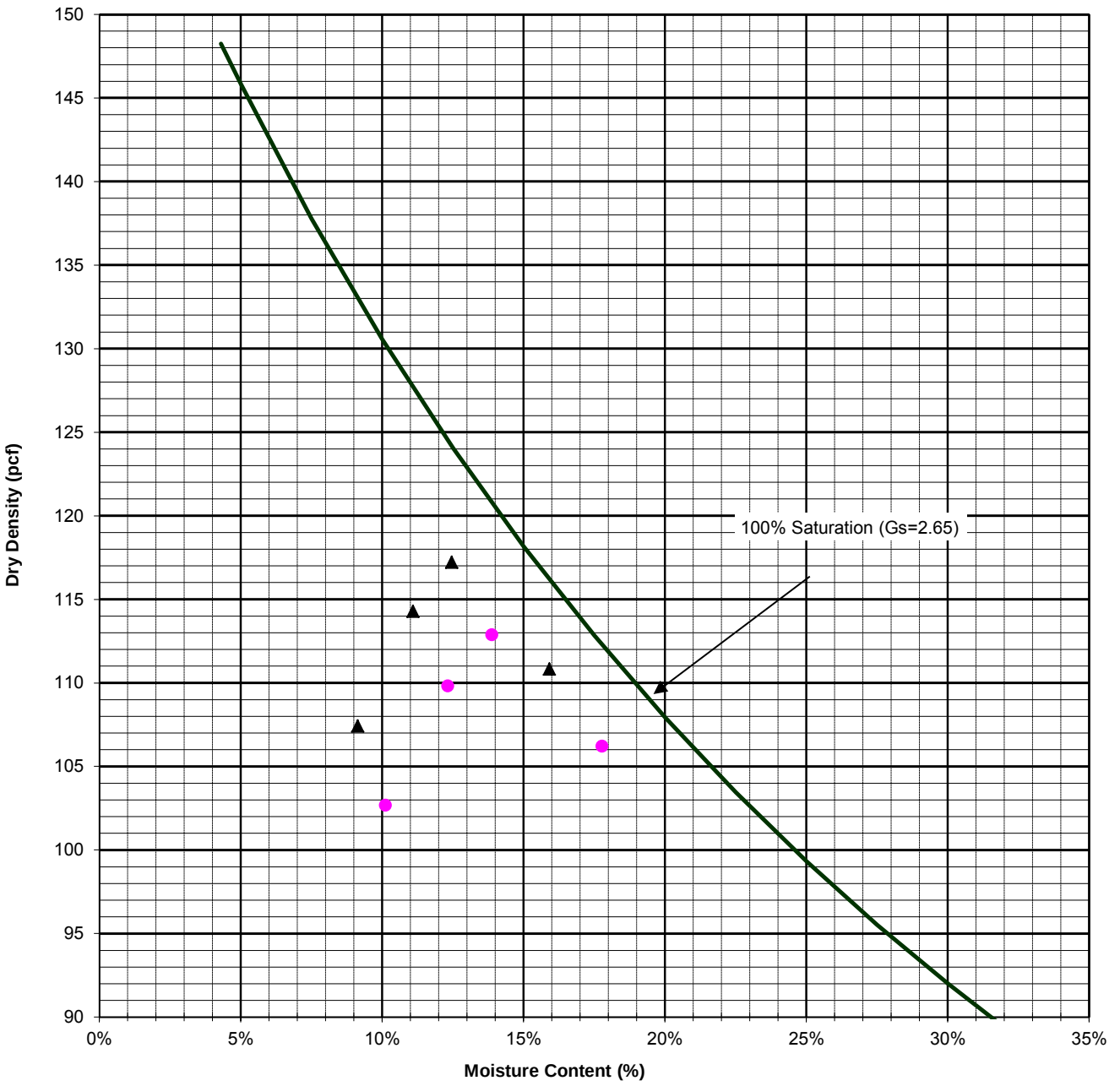
Procedure: ☐ Single Pt. ☑ Multi Pt.

Gravel Size	**3/4"**
Gravel Weight (lbs)	**1.60**
Soil Minus Gravel(lbs)	**48.99**
Total Soil Weight(lbs)	**50.59**
Gravel (%)	**3.16**

ASTM Gravel Correction Required
No

GeoEngineers

COMPACTION TEST SUMMARY



Point	1	2	3	4	Soil - Gravel
					Nat. MC
Mold + Moist Soil (lbs)	22.55	23.38	23.71	23.51	-
Mold Wt. (lbs)	14.07	14.13	14.07	14.13	-
Moist Soil (lbs)	8.48	9.25	9.64	9.38	-
Factor	0.075	0.075	0.075	0.075	-
Moist Density (pcf)	113.1	123.3	128.5	125.1	-
Pan + Moist Soil (g)	740.81	759.64	735.40	763.08	1504.10
Pan + Dry Soil (g)	680.48	685.54	656.04	660.60	1386.90
Moisture Loss (g)	60.33	74.1	79.36	102.48	117.2
Pan Tare (g)	84.59	84.39	84.30	84.12	228.44
Dry Soil (g)	595.89	601.15	571.74	576.48	1158.46
Moisture Content (%)	10.1%	12.3%	13.9%	17.8%	10.1%
Dry Density (pcf)	102.7	109.8	112.9	106.2	
Corr. Moisture (%)	9.1%	11.1%	12.5%	15.9%	
Corr. Dry Density (pcf)	107.4	114.3	117.2	110.8	
Comments			Max	Pumping	

Job Name:	American Plating
Job Number:	10751-002-01
Exploration #:	STK-2
Sample #:	
Depth:	Grab

Date:	8/31/11
Tested by:	SAS

Soil Description:	Silty sand with gravel (SM)

MDD (pcf)	**117.2**
OMC (%)	**12.5**

▲ = Corrected Values

● = Uncorrected Values

ASTM Test Method:			
☑ D 1557	☐ A	☐ B	☑ C
☐ D 698	☐ A	☐ B	☐ C

Procedure: ☐ Single Pt. ☑ Multi Pt.

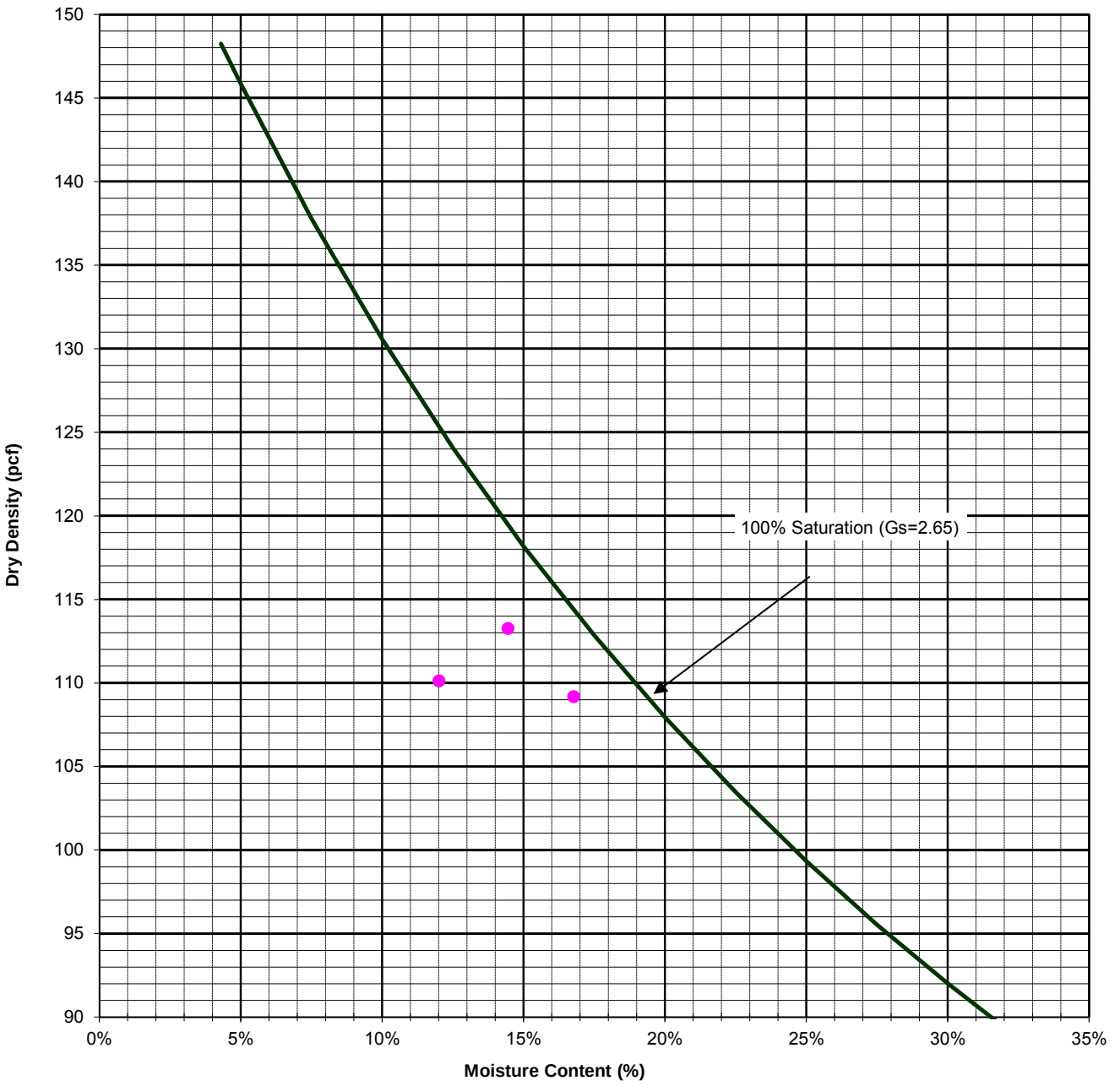
Gravel Size	**3/4"**
Gravel Weight (lbs)	**5.27**
Soil Minus Gravel(lbs)	**44.32**
Total Soil Weight(lbs)	**49.59**
Gravel (%)	**10.63**

ASTM Gravel Correction Required
Yes

GeoEngineers

12/21/2011

COMPACTION TEST SUMMARY



Point	1	2	3	4	Soil - Gravel
					Nat. MC
Mold + Moist Soil (lbs)	23.32	23.85	23.63		-
Mold Wt. (lbs)	14.07	14.13	14.07		-
Moist Soil (lbs)	9.25	9.72	9.56		-
Factor	0.075	0.075	0.075		-
Moist Density (pcf)	123.3	129.6	127.5		-
Pan + Moist Soil (g)	642.36	655.07	671.16		1233.60
Pan + Dry Soil (g)	582.53	583.01	586.95		1137.50
Moisture Loss (g)	59.83	72.06	84.21		96.1
Pan Tare (g)	84.45	84.63	85.27		337.20
Dry Soil (g)	498.08	498.38	501.68		800.3
Moisture Content (%)	12.0%	14.5%	16.8%		12.0%
Dry Density (pcf)	110.1	113.2	109.1		
Corr. Moisture (%)	-	-	-		
Corr. Dry Density (pcf)	-	-	-		
Comments		Max			

Job Name:	American Plating
Job Number:	10751-002-01
Exploration #:	STK-3
Sample #:	
Depth:	Grab

Date:	8/31/11
Tested by:	SAS

Soil Description:	Sandy silt (ML)

MDD (pcf)	**113.2**
OMC (%)	**14.5**

▲ = Corrected Values

● = Uncorrected Values

ASTM Test Method:			
☑ D 1557	☐ A	☐ B	☑ C
☐ D 698	☐ A	☐ B	☐ C

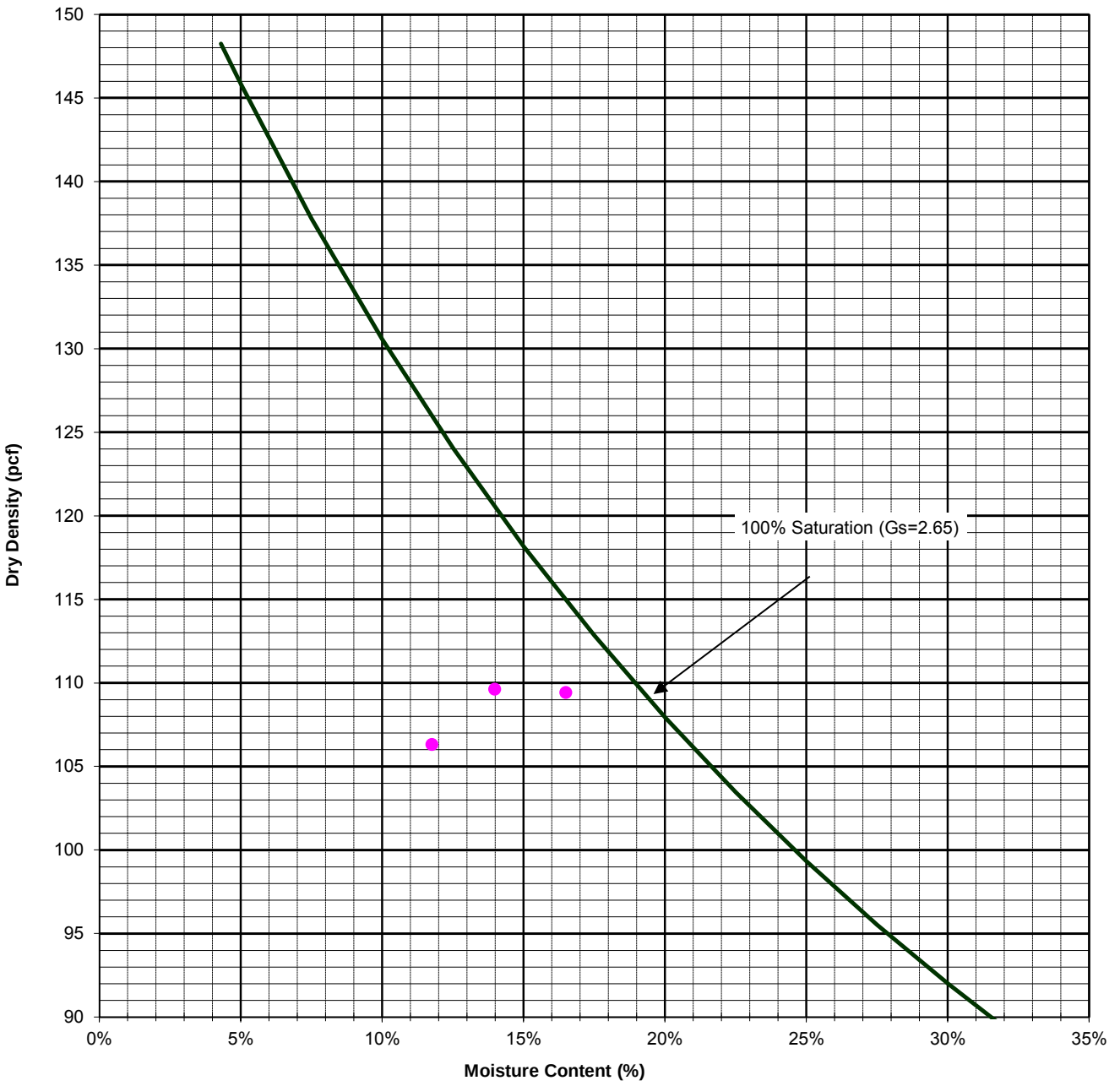
Procedure: ☐ Single Pt. ☑ Multi Pt.

Gravel Size	**3/4"**
Gravel Weight (lbs)	**0.07**
Soil Minus Gravel(lbs)	**45.42**
Total Soil Weight(lbs)	**45.49**
Gravel (%)	**0.15**

ASTM Gravel Correction Required
No

GeoEngineers

COMPACTION TEST SUMMARY



Point	1	2	3	4	Soil - Gravel
					Nat. MC
Mold + Moist Soil (lbs)	23.04	23.44	23.69		-
Mold Wt. (lbs)	14.13	14.07	14.13		-
Moist Soil (lbs)	8.91	9.37	9.56		-
Factor	0.075	0.075	0.075		-
Moist Density (pcf)	118.8	124.9	127.5		-
Pan + Moist Soil (g)	643.31	645.96	735.46		1298.80
Pan + Dry Soil (g)	584.49	576.92	643.55		1199.30
Moisture Loss (g)	58.82	69.04	91.91		99.5
Pan Tare (g)	84.36	83.60	86.60		213.83
Dry Soil (g)	500.13	493.32	556.95		985.47
Moisture Content (%)	11.8%	14.0%	16.5%		10.1%
Dry Density (pcf)	106.3	109.6	109.4		
Corr. Moisture (%)	-	-	-		
Corr. Dry Density (pcf)	-	-	-		
Comments		Max			

Job Name:	American Plating
Job Number:	10751-002-01
Exploration #:	STK-4
Sample #:	
Depth:	Grab

Date:	8/31/11
Tested by:	SAS

Soil Description:	Sandy silt (ML)

MDD (pcf)	**109.6**
OMC (%)	**14.0**

▲ = Corrected Values

● = Uncorrected Values

ASTM Test Method:			
☑ D 1557	☐ A	☐ B	☑ C
☐ D 698	☐ A	☐ B	☐ C

Procedure: ☐ Single Pt. ☑ Multi Pt.

Gravel Size	**3/4"**
Gravel Weight (lbs)	**0.44**
Soil Minus Gravel(lbs)	**42.32**
Total Soil Weight(lbs)	**42.76**
Gravel (%)	**1.03**

ASTM Gravel Correction Required
No

GeoEngineers

Sieve Analysis

Project Name: American Plating
Project Number: 10751-002-01
Tested By: SAS/TML
Date: 9/1/2011
Exploration No.: STK-1
Sample No.:
Depth: Grab

Moisture Content (%)	14.8%

Sieve Size	Percent Passing (%)
3.0 in. (75.0-mm)	100.0
1.5 in. (38.1-mm)	100.0
3/4 in. (19.0-mm)	98.6
3/8 in. (9.5-mm)	96.9
No. 4 (4.75-mm)	92.3
No. 10 (2.00-mm)	85.5
No. 20 (.850-mm)	80.8
No. 40 (.425-mm)	76.7
No. 60 (.250-mm)	70.5
No. 100 (.150-mm)	62.8
No. 200 (.075-mm)	52.1

Size Fraction	Percent By Weight
Coarse Gravel	1.4
Fine Gravel	6.3
Coarse Sand	6.8
Medium Sand	8.8
Fine Sand	24.6
Fines	52.1
Total	100.0

LL
PI

D10
D30
D60 0.13

Cc
Cu

ASTM Classification

Group Name Brown sandy silt
Symbol (ML)

GeoEngineers

Figure

Soil Classification Data Sheet

Sieve Analysis

Project Name: American Plating
Project Number: 10751-002-01
Tested By: SAS/TML
Date: 9/1/2011
Exploration No.: STK-2
Sample No.:
Depth: Grab

Moisture Content (%)	10.1%

Sieve Size	Percent Passing (%)
3.0 in. (75.0-mm)	100.0
1.5 in. (38.1-mm)	100.0
3/4 in. (19.0-mm)	94.3
3/8 in. (9.5-mm)	83.5
No. 4 (4.75-mm)	76.3
No. 10 (2.00-mm)	70.2
No. 20 (.850-mm)	63.4
No. 40 (.425-mm)	56.7
No. 60 (.250-mm)	49.8
No. 100 (.150-mm)	43.5
No. 200 (.075-mm)	35.7

Size Fraction	Percent By Weight
Coarse Gravel	5.7
Fine Gravel	17.9
Coarse Sand	6.2
Medium Sand	13.5
Fine Sand	21.0
Fines	35.7
Total	100.0

LL
PI

D10
D30
D60 0.60

Cc
Cu

ASTM Classification

Group Name Brown silty sand with gravel
Symbol (SM)

GeoEngineers

Figure

Soil Classification Data Sheet

Sieve Analysis

Project Name: American Plating
Project Number: 10751-002-01
Tested By: SAS/TML
Date: 9/1/2011
Exploration No.: STK-3
Sample No.:
Depth: Grab

Moisture Content (%)	12.0%

Sieve Size	Percent Passing (%)
3.0 in. (75.0-mm)	100.0
1.5 in. (38.1-mm)	100.0
3/4 in. (19.0-mm)	100.0
3/8 in. (9.5-mm)	98.2
No. 4 (4.75-mm)	94.7
No. 10 (2.00-mm)	89.6
No. 20 (.850-mm)	85.4
No. 40 (.425-mm)	81.4
No. 60 (.250-mm)	74.6
No. 100 (.150-mm)	66.1
No. 200 (.075-mm)	54.6

Size Fraction	Percent By Weight
Coarse Gravel	
Fine Gravel	5.3
Coarse Sand	5.0
Medium Sand	8.2
Fine Sand	26.8
Fines	54.6
Total	100.0

LL
PI

D10
D30
D60 0.10

Cc
Cu

ASTM Classification

Group Name Brown sandy silt
Symbol (ML)

GeoEngineers

Figure

Soil Classification Data Sheet

Sieve Analysis

Project Name: American Plating
Project Number: 10751-002-01
Tested By: SAS/TML
Date: 9/1/2011
Exploration No.: STK-4
Sample No.:
Depth: Grab

Moisture Content (%)	10.1%

Sieve Size	Percent Passing (%)
3.0 in. (75.0-mm)	100.0
1.5 in. (38.1-mm)	100.0
3/4 in. (19.0-mm)	96.5
3/8 in. (9.5-mm)	94.4
No. 4 (4.75-mm)	90.7
No. 10 (2.00-mm)	84.7
No. 20 (.850-mm)	80.5
No. 40 (.425-mm)	76.2
No. 60 (.250-mm)	69.1
No. 100 (.150-mm)	61.0
No. 200 (.075-mm)	50.5

Size Fraction	Percent By Weight
Coarse Gravel	3.5
Fine Gravel	5.8
Coarse Sand	6.0
Medium Sand	8.5
Fine Sand	25.7
Fines	50.5
Total	100.0

LL
PI

D10
D30
D60 0.14

Cc
Cu

ASTM Classification

Group Name Brown sandy silt
Symbol (ML)

GeoEngineers

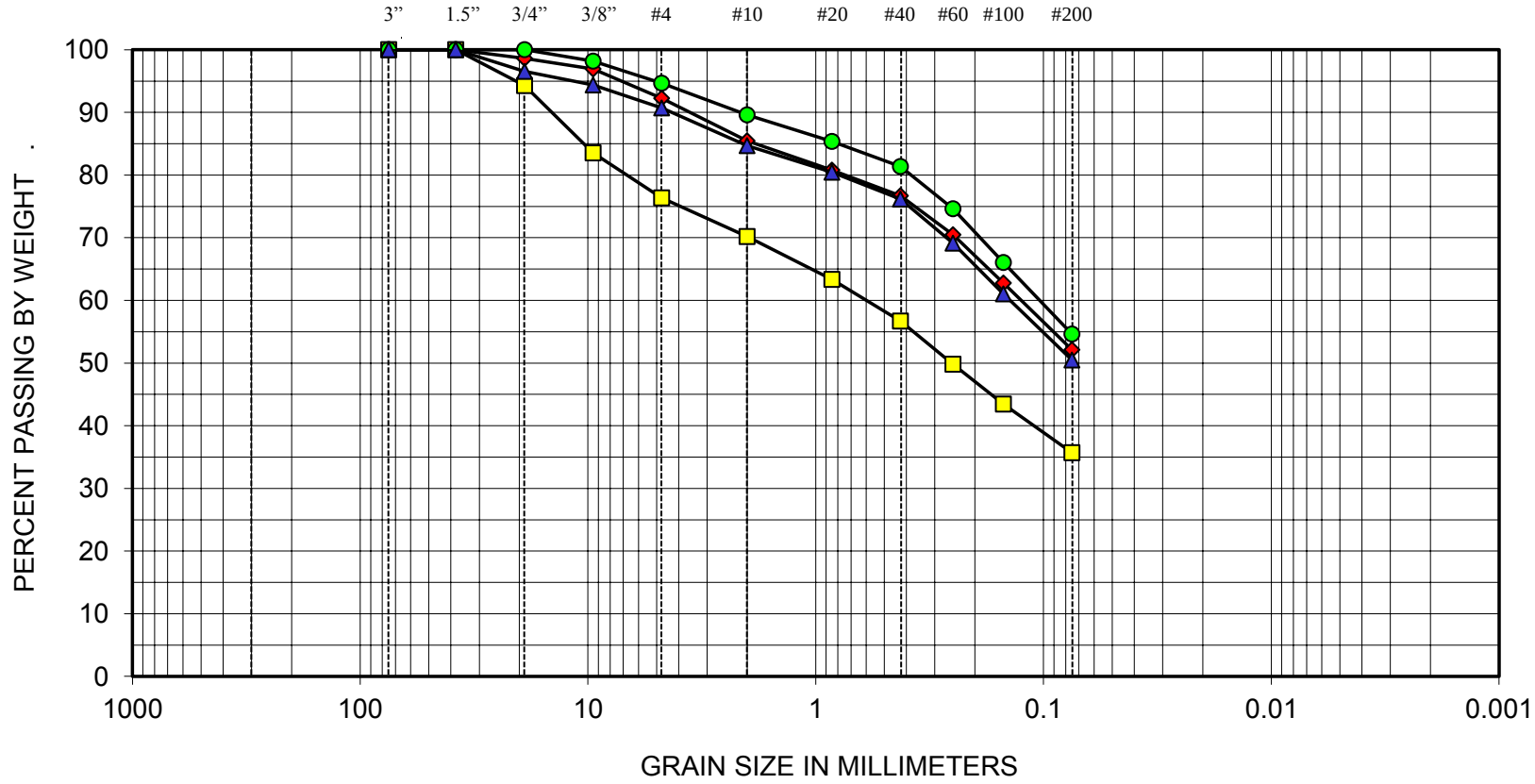
Figure

Soil Classification Data Sheet

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FIGURE

SIEVE ANALYSIS RESULTS



BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	EXPLORATION NUMBER	DEPTH (ft)	SOIL CLASSIFICATION
◆	SK-1	Grab	Sandy Silt (ML)
■	SK-2	Grab	Silty sand with gravel (SM)
●	SK-3	Grab	Sandy Silt (ML)
▲	SK-4	Grab	Sandy Silt (ML)